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And *The Nation's Health*

Volume XIX July 1929 Number 7

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Effect of Atmospheric Pollution Upon Incidence of Solar Ultra-Violet Light*

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THERE has been much discussion about the rôle of atmospheric pollution in the occlusion of solar ultra-violet light, but a great paucity of experimental work to ascertain the facts. As long as the subject is in the discussion stage, it lacks the stimulus to make it worthy of serious effort on the part of civic bodies to employ remedial measures, particularly when such efforts must overcome the inertia of public opinion as well as the active resistance of financial and commercial interests. It was to find out the facts that this work was undertaken.

In 1922, the International Union of Geodesy and Geophysics, meeting in Rome, Italy, made provision for an international study of the dust content of the atmosphere.[1] Kimball and Hand [2] determined the number of dust particles in the atmosphere of Washington, D. C., and its suburbs, over two winter seasons. The greatest number occurred in December and January, and the smallest in May to October inclusive. In December and January there was over twice as much dust in the city air (Weather Bureau) as there was in that of the suburbs (American University), but in February and March, the difference was only about 33 per cent. They showed that coincident with the decrease in consumption ratio of bituminous coal to anthracite coal, the dustiness decreased. They found about 18

* Read before the Health Officers Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

per cent less dust at the top of the Washington Monument (500 ft.) than at its base, but more in both cases than at the American University. In Chicago the number of dust particles in the loop district was from 25 to 80 per cent greater than at Chicago University (in a residence section).

In 1927, Bundesen and his coworkers [8] found by spectrographic measurements that there was a materially lower incidence of solar ultra-violet light when the sun's rays traversed the smoke-pall arising from the stockyards than when the wind was from the northeast, which removed it.

It has long been recognized that some method must be adopted for measuring atmospheric pollution, particularly when the objective is to ascertain the rôle of smoke. The general plan has been to weigh and analyze the solid material which settles in catch-cups in stated periods. The results are expressed in terms of tons per square mile per year. This method has yielded very interesting data, particularly as carried out in the extensive investigations of the Committee on Smoke and Noxious Vapors Abatement in England,[4] the Mellon Institute in Pittsburgh,[5] the Herron Company in Cleveland,[6] and Monnett and Hughes at Crafton.[7]

Such data directed public attention to the subject, with the result that municipal ordinances were enacted, and in some cases enforcement facilities were provided, to combat the evil of a smoke laden atmosphere. Among such municipalities was Pittsburgh.

In 1926, a critical study of smoke control in Pittsburgh was made by Meller [9] to ascertain the result of 10 years' enforcement. It was found that whereas the amount of tar (representing smoke solids) was reduced approximately 70 per cent, the total deposit had increased about 40 per cent. Thus one type of pollution was reduced but another substituted, presumably due to the installation of blowers under grates.

If the health aspects of the relation of atmospheric pollution to the incidence of ultra-violet light are to provide the stimulus and constitute the basis respectively for the enactment and the structure of an anti-air-pollution ordinance, we need more definite information as to actual facts. Do suspended solids in the atmosphere actually occlude solar ultra-violet light? If so, are we any better off if we substitute siliceous for tarry solids; in other words, ash for smoke? Such was our problem.

Numerous methods have been proposed for the direct measurement of solar ultra-violet light. Coblentz [9] critically discusses a number of these. Winchester [10] states that determinations based on

the measurement of heat are unsatisfactory. We were forced to use available materials; so chemical methods were adopted, a number being run in parallel.

Our greatest reliance was placed on the lithopone method of Clark,[11] whereby a water paste of lithopone (a mixture of zinc sulphide and barium sulphate) on a microscopic slide under a quartz cover darkens to a reflection factor of 50 per cent in a time period inversely proportional to the intensity of the ultra-violet light. A study of this method by Brickwedde[12] showed that its activity begins with wave-lengths about 254 $\mu\mu$, and extends to 335 $\mu\mu$ with the maximum at 313 $\mu\mu$. Variations in the wetness of the paste made no difference in sensitivity. All determinations were made with material from the same batch. Our determinations were always read by the same operator at 11 o'clock in the morning. Within the working conditions of our experiments, the temperature factor was found to be negligible.

The next most useful chemical method was the methylene-blue-acetone-water solution, developed by Webster, Hill and Eidenow,[13] modified by Kimball and Hand.[14] The quartz tubes containing the solution were exposed for 24-hour periods and compared with a standard made up in like manner. Gillam and Morton[15] state that this method is sensitive to the following wave-lengths to the degree specified:

Rays below 275 $\mu\mu$	88.0 per cent
Rays at 275–325 $\mu\mu$	6.4 per cent
Rays above 325 $\mu\mu$	5.6 per cent

Another chemical method run in parallel was uranyl sulphate, used by Anderson and Robinson.[16] Solutions of uranyl sulphate and oxalic acid were exposed for 24 hours in quartz tubes, and titrated with potassium permanganate to measure the photo-chemical decomposition of the oxalic acid. Gillam and Morton (cf. above) give the sensitivity as follows:

Rays below 275 $\mu\mu$	60.8 per cent
Rays at 275–325 $\mu\mu$	14.6 per cent
Rays above 325 $\mu\mu$	24.6 per cent

We also used the so-called potassium iodide test of Pohle.[17] This consisted of exposing a standard solution of purified potassium iodide and dilute sulphuric acid in quartz tubes for 24 hours. The photo-chemical decomposition of the potassium iodide was measured by titrating with sodium thiosulphate.

In order to ascertain the distribution of suspended solids in the atmosphere, catch-cups were placed in three groups: one at the Health

Department, nearly in the center of Baltimore (Group A); five in an arc about 3 miles from the center, thus lying in the near suburbs (Group B); and three in an arc about 10 miles out in the country on farms well back from highways (Group C). Thus, the conditions of the atmosphere as indicated by the findings in Group C constituted our actual control. Any atmospheric pollution or light occlusion in the city which was at variance with the conditions in Group C was incident to city conditions, avoidable or not. In other words, Group C showed us what might be the best atmospheric condition that could be obtained locally. The cups were placed at street level, and protected from animals by locating them at fire engine houses where they could be kept under constant observation.

The determinations of settlings from the atmosphere were made from March, 1926, to October, 1928, but the data in relation to the incidence of solar ultra-violet light of only one year are presented. Some of the earlier lithopone measurements were open to such serious criticism that all readings for the year were discarded. The cups were collected each month and the contents analyzed. Table I gives the data collected from April, 1927, to April, 1928, inclusive, but the tonnage is expressed on a 12-month basis. It is the relative quantities which are significant.

TABLE I

CONTENTS OF CATCH-CUPS EXPRESSED IN TONS PER SQUARE MILE PER YEAR

	Group A	Group B	Group C
Total solids	1,800.0	800.0	340.0
Tar	8.7	5.6	3.2 (2.1)*
Ash	810.0	380.0	130.0
Ultra-violet light **	1.0	—	1.5

* Omitting an inexplicably high value
** Determined by lithopone at one station in Group C

The number of dust particles per c.c. of air was determined by J. J. Bloomfield of the U. S. Public Health Service, using the konimeter.

TABLE II

ATMOSPHERIC DUST DETERMINATIONS* MADE WITH THE KONIMETER

	Dust Count in Particles per c.c. of Air			
	Over 10 μ	Between 5 and 10 μ	Under 5 μ	Visibility during Tests
Group A**	1.0	1	85	Clear, hazy and smoky
Group B	0.6	1	51	Slightly hazy, clear and breezy
Group C	0.5	0	22	Clear

* Each figure is an average of four determinations
** One station

In view of the striking increase in the amount of ultra-violet light indicated in the area where the atmospheric pollution is least, we

checked the dependability of the lithopone method and the technic by a number of the other photo-chemical reactions described, making the determinations at the same time.

TABLE III

COMPARATIVE DETERMINATIONS OF ULTRA-VIOLET LIGHT MADE IN CITY AND COUNTRY

(Average of daily readings from June 16 to August 14)

Photo-chemical Agent	Place		Meteorological Control	
	City	Country	Mean Temp. Degrees	Solar and Sky Radiation gm. cal. per min. per cm.
Lithopone	1	1.40	87–95	370–600
Oxalic Acid	1	1.04	87–95	370–600
Potassium Iodide	1	1.54	87–95	370–600
(Average of daily readings from November 23 to February 10)				
Methylene-Blue-Acetone	1	1.50	63–78	135–225
Lithopone	1	1.98	63–78	135–225

The actual readings are recalculated on the basis of city readings as unity

The readings were taken without any regard for the so-called "clearness" of the day. The term represents such an ill-defined condition that we considered there would probably be as much error in deciding when a day was clear as there would be in the reading itself. In order to ascertain just what difference there might be between readings taken over a long period when all days were used, versus so-called "clear days," the determinations in Table IV were made. These indicate the greater extent to which clear days transmit ultra-violet light than cloudy days.

TABLE IV

COMPARISON OF READINGS ON EACH DAY VERSUS CLEAR DAYS

	Clear Days		All Days*	
	City	Country	City	Country
Lithopone				
May–June	1	1.29	1	1.49
Nov.–Jan.	1	1.68	1	1.98
Methylene-Blue-Acetone				
May–June	1	1.42	–	—
Nov.–Feb.	1	2.00	1	1.50

* These readings are taken from Table III

From the above data it is clear that there is a far greater incidence of ultra-violet light in the country than in the city, and there is far more atmospheric pollution in the city than in the country. Carrying the inquiry further in order to ascertain whether these facts are really related, we measured the amount of atmospheric pollution and the incidence of ultra-violet light on the top of a city building 230 feet high, and coetaneously on the sidewalk near its base. The results are given in Table V.

These data show clearly that in the city there is an inverse relation

TABLE V

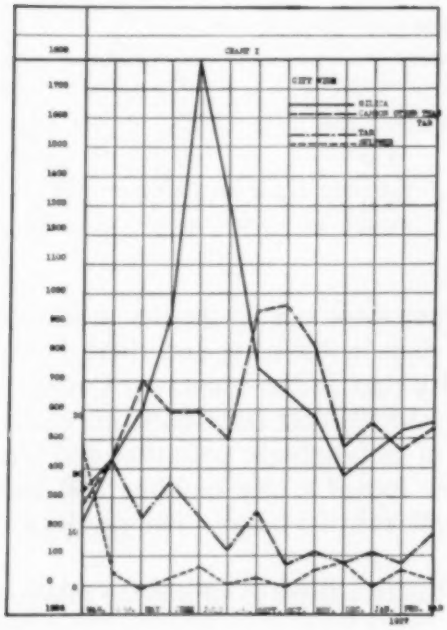
MEASUREMENTS OF DUST AND ULTRA-VIOLET LIGHT AT DIFFERENT HEIGHTS IN CITY

Dust	On Top of Building (T)	On Sidewalk (S)	Ratio (T : S)
Solids (Tons per sq. mile)	4,566	5,359	1 : 1.18
Tar (Tons per sq. mile)	22	53	1 : 2.41
Ash (Tons per sq. mile)	2,475	3,188	1 : 1.28
Ultra-Violet Light			
Lithopone*	0.43	0.31	
	0.39	0.26	
	0.54	0.39	1 : 0.7
Methylene-Blue-Acetone*	16.8	15.6	
	17.2	16.2	
	14.2	15.0	1 : 0.97

* Each figure is an average of twenty-five daily determinations

between atmospheric dirt and the incidence of ultra-violet light. It is quite presumable that atmospheric dirt is the cause of the occlusion of much solar ultra-violet light. To settle this point, we determined to measure the occluding effect of various dusts. We constructed a wooden box 36″ by 18″ by 18″, with an inlet for introducing the dust, and with quartz windows 5½″ by 5½″ at opposite ends. Two small electric fans were placed inside to keep the dust in suspension.

The incidence of solar ultra-violet light was measured in the beam traversing both quartz windows, thus passing through the box, and again when the given dust was introduced. These results are recorded in Table VI.



In Chart I, we have presented curves showing how the constituents of atmospheric pollution vary over the season. During 1926 unusually large amounts of bituminous coal were used, followed by an increasing use of anthracite. Manufactured gas is being used to an increasing extent for heating. The spring of 1926 was unusually dry. The curves show that the greatest pollution from all sources occurs in the spring and summer seasons, and the peaks of the different kinds of pollution lie at different seasons.

Determinations of the incidence of bacteria in the air were

TABLE VI

RELATIVE INCIDENCE OF ULTRA-VIOLET LIGHT THROUGH SEVERAL DUSTS

	Percentage of transmission		
	1 gm. dust	2 gms. dust	5 gms. dust
Fuller's earth*	77 per cent	75 per cent	60 per cent
Street sweepings*	94 per cent	64 per cent	54 per cent
Lamp Black*	40 per cent	21 per cent	14 per cent

* Sieved through 200 mesh

made by exposing agar plates for approximately 5 minutes, incubating at 37° C. and counting the colonies. The peak of bacterial contamination lies at the time of year when the incidence of ultra-violet light is least.

Some measurements were made to determine the sky radiation in the city. Determinations were made with lithopone of direct solar and diffuse skyshine on 14 " clear " days in October and November, 1927. The results are tabulated in Table VII.

TABLE VII

DETERMINATION OF SKYSHINE VERSUS DIRECT SUNSHINE

	Sun	Sky
14 determinations	0.13– 0.33	0.13– 0.25
Average	0.284	0.199

Thus, the skyshine constitutes 70 per cent of the direct solar ultra-violet light, a good confirmation of the figure reported by Tisdall and Brown[7] in Toronto of about 50–67 per cent.

SUMMARY AND CONCLUSIONS

Solar ultra-violet light has been measured by the lithopone method and checked by three other chemical methods. Dust-cups and konimeter measurements of atmospheric pollution indicated that this was heaviest in the center of the city and fell off to approximately one-sixth as much in the country. Contrariwise, the amount of ultra-violet light in the country was 50 per cent greater than in the city. In parallel with this, it was found that the amount of settled dust on the top of a tall city building was materially less than at street level, while the incidence of solar ultra-violet light on the building was greater than at street level. Measurements made on " clear " days showed somewhat greater incidence of ultra-violet light than on cloudy days. The passage of ultra-violet light through confined air artificially polluted with fuller's earth, street sweepings and lamp black, respectively, shows that they are increasingly effective in the order mentioned in occluding solar ultra-violet light. Skyshine yields about 70 per cent of the amount of ultra-violet light received by direct sunlight.

From this study, we conclude that:

1. The lithopone method is dependable for field use in measuring solar ultra-violet light.

2. The belief that atmospheric pollution actually occludes ultra-violet light to a very great extent is well founded.

3. The constituents of atmospheric pollution in summer are greater in quantity and different from those in winter.

4. Skyshine is equivalent to about 70 per cent direct sunshine in content of ultra-violet light.

5. Carbon as tarry products is materially more inhibitive to the incidence of ultra-violet light than siliceous materials.

REFERENCES

1. Kimball and Hand. *Month. Weather Rev.*, 52: 133 (Mar.), 1924.
2. *Ibid.*, 133–139.
3. Bundesen, *et al. J. A. M. A.*, 1927, p. 187.
4. *Final Report Ministry of Health, London, 1921.* Cf. also *Reports of the Great Britain Advisory Committee on Atmospheric Pollution, 1914, et seq.*
5. *Mellon Institute Bull.* Smoke Investigation 8, 1914.
6. Herron. Report on Investigation of Atmospheric Contamination in the City of Cleveland. *Ann. Rep. Community Betterment Council*, 1921.
7. Monnett and Hughes. Bur. of Mines, *Tech. Paper No. 338*, 1924.
8. Meller. *Indust. & Eng. Chem.*, 16: 1049, 1924.
9. Coblentz. *Radiology*, 10: 116, 1928.
10. Winchester. *Bull. Nat. Res. Council*, July, 1927, p. 108.
11. Clark. *Am. J. Physiol.*, 69: 200, 1924.
12. Brickwedde. *J. Opt. Soc. of Amer.*, 14: 312, 1927.
13. Webster, Hill and Eidenow. *Lancet*, Apr. 12, 1924.
14. Kimball and Hand. *Bull. Nat. Res. Council*, 61: 123, 1927.
15. Gillam and Morton. *J. Soc. Chem. Ind.*, Nov. 4, 1927.
16. Anderson and Robinson. *J. Am. Chem. Soc.*, 47: 718, 1925.
17. Pohle. *J. A. M. A.*, 86: 818, 1926.
18. Tisdall and Brown. *Am. J. Dis. Child.*, 34: 737–741, 1927.

Public Health and the Public Purse[1]

TO have their good deeds interred with their bones is the common lot of sanitary reformers: an unmindful public gives little heed to disasters which would have been. The achievements in diminished mortality in fevers in a period of 70 years following the initiation of sanitary legislation in England in 1848 were summarized by Sir William Hunter. He pointed out that if the rate of mortality which existed in England and Wales for the years 1847–1850 were applied to the 4 years 1916–1919, the following would be the position:

Typhus would have killed 100,000, whereas the actual number of deaths was 7.
Typhoid would have killed 70,000, whereas the actual number of deaths was 3,626.
Cholera would have killed 114,000, instead of which there were no deaths from cholera for 30 years.
Smallpox would have killed 42,000, whereas the actual number of deaths was 110.
Scarlet fever would have killed 122,000, whereas the actual number of deaths was 5,390.
Diphtheria would have killed 30,000, whereas the actual number of deaths was 19,631.
Measles would have killed 56,000, whereas the actual number of deaths was 29,272.
Whooping cough would have killed 66,000, whereas the actual number of deaths was 23,087.

REFERENCE

1. McCarron, E. P. *J. State Med.*, May, 1929, pp. 274–275.

Medical and Public Health Work in a Large Coal Company*

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THIS paper is a brief report of the work of our organization as it has been carried on for the past year or more by The Consolidation Coal Company, Inc., one of the largest producers of bituminous coal in the United States.

For a number of years physicians have been employed on a contract basis. Each employee contributed a stated amount monthly toward his medical expenses, which was withheld from his wages and paid to a designated physician. Obstetrical, surgical, and venereal disease cases were charged for in addition, and a wide variety of such fees existed. The physicians were chosen by mine superintendents, other officials, or by the people themselves. One physician usually served several communities of the same company and frequently those of other companies. He would necessarily sublet some of his work. This had its undesirable features.

Slightly more than a year ago there were approximately 35 physicians employed by our company on this basis, each independent of the others, without coördination and coöperation. No definite plan of work existed; methods and equipment were not standardized; and a great deal of the practice of medicine was on a pill dispensing basis. Records were inadequate, and an organized health program was lacking.

Nurses administered to the sick and injured in the homes; assisted with the household duties; and filled in wherever they were needed.

Many of the physicians and nurses deserve great praise for their work, as at times it was very rigorous and pioneering. Transportation facilities were very poor and inadequate, living conditions bad, and many unreasonable demands were made. With improved highways, living conditions, state and county health programs, educational work, and a direct interest on the part of the companies, there is a gradual transition to a new mode.

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* Read before the Industrial Hygiene Section of The American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

FUNDAMENTAL FACTORS OF OUR MEDICAL PROGRAM

Our main problem is to provide medical and nursing service for 10,000 employees and their families. Our operations extend into 4 states—Kentucky, West Virginia, Pennsylvania and Maryland—with 6 divisions, the minimum distance between any 2 being approximately 60, and the maximum 300 or more miles. One division covers 30 miles and our communities are widely separated.

The scattered locations of our employees and communities make it difficult at times to carry on our program, as we cannot centralize our medical and nursing work. This has resulted in the establishment of areas or " medical units," based upon location and number of employees, each in charge of a physician and a public health nurse. Usually there is one full-time physician to a unit but in several instances two are required. At present there are 13 units, in the charge of 18 full-time physicians. Employees receive all usual medical attention, including minor surgery. Hospital service is given by private or state institutions, with the exception of one division where we operate our own 50-bed hospital.

Employees contribute on a monthly basis, and no charge is made for treatment, drugs, dressing or other materials, but $20.00 is allowed the physician in obstetrical cases, and small fees in venereal diseases.

The executives of the company, realizing the possibilities of an organized medical department, made a survey of the medical, hospital, nursing and sanitation problems of all its properties in 1926 and the early part of 1927. The present program had its inception about July 1, 1927.

Staff and Personnel—Our personnel consists of 18 full-time physicians in charge of 13 medical units, a chief hospital surgeon, an assistant, a full-time laboratory physician, 6 dentists, a supervisor of public health nurses, 11 full-time public health nurses, and 8 hospital nurses. During the past year we have reduced our staff of physicians from approximately 35 to 18, replacing part-time by full-time men. Under the direction of the supervisor, the public health nurses are conducting a well rounded-out public health program, with the assistance of the physicians and other personnel.

The medical director is directly responsible for the activities of the doctors, nurses, hospital, etc., to the director of industrial relations who in turn is responsible to the vice-president of operations.

The Medical Program—The most important major phase consists in the care of injured and ill employees and their families. This includes visits to the home, and consultations and treatment in the medical unit. One of our greatest problems is to make patients come to

the doctor's office. Rather than go to the unit, the physician is often called to the home for very minor ailments, which is time consuming and annoying.

This is the only objection to the plan of monthly contributions by the employee, for some feel that the monthly sum they are paying entitles them to call the physician to the home for any cause.

We believe that a long established precedent in the coal field is responsible for this and are gradually overcoming it by an educational campaign through the doctors, nurses, personnel managers, operating officials and by group meetings between departments and staffs.

We have standardized equipment, instruments, drugs, and supplies, so that all units are practically the same, and we have attempted to impress our employees with the necessity and advisability of seeking relief here whenever possible, since they can be better taken care of where the facilities are available than in the home. Progress is slow, but there is a gradual improvement.

Dispensing of Drugs is the second major phase. Company employees attended by company physicians are provided with drugs, medicines, dressings and supplies without additional charge. A stock of the usual drugs and biologicals is kept at each medical unit, but patients may be requested to pay part or all of the actual cost of a special drug. A standardized drug list was determined on and each physician now requisitions his supply from this every 2 months. As a result considerable economies have been effected.

Clinics—At the clinics conducted by the company nurses, more than 7,000 individuals, mostly children, were examined by physicians and dentists during the first 8 months of 1928. This is a small beginning but represents progress.

Immunizations—While a number of immunizations have been given during the past 8 months, this activity is still in its inception, and for the present will be confined to localities where the prevalence of disease justifies it.

There were 9,947 immunizations against typhoid fever. Approximately 9,500, or 95 per cent of several communities, were immunized through compulsion, because typhoid fever was prevalent in 1927 (45 cases with 3 deaths). Only 2 cases have been reported in 1928, 1 in a person from another locality, and 1 who had not been immunized. There were 5,376 smallpox vaccinations and 1,885 toxin-antitoxin immunizations.

Daily Medical Reports—Each physician is required to make a daily medical report which covers the cases seen each day. This was primarily intended as a record of the prevalence and character of dis-

ease in our communities, with age, color and sex of those affected. A diagnosis is made if possible; otherwise the patient's chief complaint is given. A record is kept of new and return cases and of those injured in their work. This report is available to the nurse for selection of special cases. The physician indicates those he wishes her to attend. These reports are checked and summarized monthly. Persons consult our physicians for headaches, colds, constipation and other minor ailments since fees are not charged. In this way many ailments are seen which would otherwise escape attention. Only a beginning has been made, but we believe that we are making the first controlled morbidity study of an entire industrial population, numbering between 40,000 and 50,000, of all ages, nationalities and both sexes.

TABLE I

QUANTITATIVE SUMMARY OF DAILY MEDICAL REPORTS OF THE CONSOLIDATION COAL COMPANY, INC., 1928 COVERING A 5-MONTHS PERIOD

Total Calls	52,046
House Calls	14,277
Office Calls	37,378
House and Office Calls	391
Colored	6,787
White	45,259
Males	29,092
Females	22,954
Average Calls per Day	24.96
Number of Physicians Reporting	16

Table I is a summary of 5 months' work. Our employees are receiving $2.00 worth of service for every dollar paid in. The average cost per family for the usual medical attention, excluding hospitals, is approximately $36.00 per year, for which they actually pay $18.00.

Compensation Injuries—Another phase of our medical program is the care and treatment of compensable injuries, which require 1,100 to 1,300 services per month, approximately one-fourth being first treatments.

We have recently instituted the "Return-to-Work" certificate, which an employee must receive before he may return to work after an accident or long illness. The purpose is to decrease absenteeism, avoid risk, regulate compensation, and obtain data as to time lost due to injury.

Another phase of our medical program is the employment of dentists. At present we have agreements with 6 dentists, under which the company provides the location and makes collections over the pay rolls for services in accordance with a standard list of charges. The dentist agrees to adhere to these fees, extract all deciduous teeth free of charge, and perform all ordinary maintenance work for children

under 15 years of age at half price. Each child is to receive a dental examination at least once during the school year. A record is kept and follow-up work is done.

Most tonsillectomies are done by our company physicians, and a charge of $20.00 is made. Each individual is required to pay all or part of this fee, as determined by a committee, consisting of the public health nurse, the personnel manager, the mine superintendent and the auditor. If the report of the committee justifies free operation, no fee is charged.

Other special clinics, such as eye refractions and orthopedic corrections, are conducted in a similar manner, except that specialists are called in and the amount a patient cannot pay is either taken from a company charity fund or provided for by state and county funds, or such organizations as the Rotary Club, Kiwanis and similar organizations.

It is part of the duties of the physician and nurse to keep a check upon the sanitary conditions of the communities in which they work, reporting those which are a menace to health to the proper authority for correction.

Housing and Civic Improvement Department—The company has a well organized department of housing and civic improvement which has direct supervision over buildings, grounds, sanitation, etc., and cooperates with the staff of the medical department in the establishment of proper sanitary conditions.

This department maintains regular garbage and refuse collections, disinfects houses, sees to the construction and cleaning of vaults and excreta disposal, maintains the water and sewerage systems, and the cleanliness of the communities.

Laboratory—A clinical, pathological and bacteriological laboratory has recently been established, intended to serve all divisions for water and milk analyses. Physicians of our company, as well as others, may send specimens for examination, a charge being made to non-company doctors.

The Nursing Program—Our public health nursing program is divided into 10 heads:

1. Bedside
2. Prenatal
3. Maternity
4. Infant Welfare
5. Child Welfare (preschool)
6. School
7. Tuberculosis
8. Communicable Disease
9. Social Service
10. Educational

These titles indicate the type of work included in the 10 divisions. In the 8 months under consideration, 16,398 services have been ren-

dered, to which might justly be added correction of defects, attendance on clinics, weighing of children, etc., which were the direct outcome of instructions given by nurses in the course of their work.

CONCLUSION

We have given you a summary of the work of this company, and in conclusion wish to state that we have attempted to organize our medical and public health program on a sound and workable basis, one which possesses elasticity to meet our needs and also one from which we believe the employees and the company as a whole will derive the most benefit.

Sick Insurance for Airplane Workers

COMPULSORY insurance against sickness is established in Italy by a law of January 10, 1929, for persons employed on all non-military vessels and airships. The insured persons are entitled to free medical and surgical aid, including hospital care, and to a cash benefit equal to 60 per cent of their wages. The insured women are also entitled in case of confinement to obstetrical aid and to a cash benefit payable for 12 weeks, and longer if they are unable to resume their work; the wives of insured men are given obstetrical treatment. Free medical aid is also given to the members of the insured person's family.

In case of the insured person's death his wife or children are paid an amount equal to 1 month's wages. The funds necessary for the administration of this law are to be derived from contributions by the employers and the workers.—*Gazzetta Ufficiale*, Rome, Feb. 8, 1929, p. 619.

Strength and Weaknesses of County Health Organization*

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THE executive head of any department of health carries grave responsibility. It is his duty to safeguard the health of the people under his jurisdiction. The field has expanded materially during the last half century, and it is probable that it will continue to expand.

The problems of preventive medicine have been simplified so far as knowledge goes, but administration is more complex. The practice of public health requires detailed knowledge of preventive medicine, and also familiarity with matters entirely alien to the medical curriculum. The modern practitioner of public health must specialize.

Public health work is vitally concerned with individuals, in so far as they may affect the health of the general public. The control of disease involves invasion of the home and privacy of individuals, which is diametrically opposed to the traditional spirit of the American people. A typhoid fever outbreak may involve the search for carriers, and the restriction of their occupation. Effective milk control, and the provisions of the Shepherd-Towner act require intimate acquaintance with the private affairs of individuals. In one state, the health officer is not only authorized, but directed, to make an examination of any person who has, or is reasonably suspected of having, venereal disease. Such a provision involves intrusion into private affairs to the utmost degree.

We must remember that official health agencies derive their financial support from public funds. The broad general principle that funds for local developments should be collected locally applies to health work as well as to other projects. It is unfair to use state taxes for the benefit of selected counties; to tax a county for the benefit of one or more of its cities; or the rural population for the benefit of the incorporated towns. Public health work, if it is to be supported from public funds, must be developed on a basis which,

* Read before the Health Officers Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

so far as possible, will benefit equally *all* of the people taxed. This carries the corollary that public interest must be developed in the proposed work. Without it local taxes cannot be assessed or collected.

The complexity of modern health work, the need for specially trained personnel, for intimate contact with the people, the obligation to give service for the equal benefit of those concerned, and the necessity for developing local interest to support tax levies—all indicate that the ultimate unit of health organization must be local, if it is to be adequate and enduring. The unit of operation must be large enough to provide funds sufficient to employ trained personnel, and to support the work conducted under its direction. It must be small enough to allow the establishment of friendly relationships with the people of the community, equal distribution of services, and the development of local interest.

Except in the case of very small states, these considerations would reduce the size of the field units to the county, city, township, or town. Cities of sufficient size can, and often do, support their own health departments. In operation, however, no city department can confine its interests to the corporation limits; for example, in milk control, meat inspection, sewage disposal, and water supplies, unless the outlying districts are under adequate health service. The township and small town are generally too small to support the work required of a modern health department.

The county, on the other hand, offers such advantages that in many states it has been chosen as the base for local health administration. It is timely to consider the strength and the weaknesses inherent in this plan of organization.

ELEMENTS OF STRENGTH

1. The county is the largest unit of purely local government. Other activities based upon this unit have long been recognized and accepted—there are county commissioners, financial officers, courts and officers of justice, superintendents of schools, and agricultural agents. It would therefore involve no radical departure if there should be a county department of health, but put such work on a par with other important agencies.

2. Being a legally defined governmental unit, the county is a unit for taxation purposes, with an established system for collecting and handling tax funds and apportioning assessments. The collection of a special assessment for health work, or the allocation of funds offers no special difficulties.

Although counties vary markedly in wealth, as a rule sufficient funds for the maintenance of a full-time health department can be raised without undue burden upon the taxpayer. The expenditures for health in the county with which the writer is connected amounted in 1927 to $18,107.35, or 43 cents per capita, which maintained a full-time staff of 8 members. The budget for 1928 totals $21,950.00, or approximately 51 cents per capita, including all subsidies. In the first 7 months of 1928, 17,509 services were rendered. These included the handling of 995 cases of reportable disease, 4,993 sanitary inspections, and 11,063 services by the public health nursing division, among which were 3,755 home calls, including 140 prenatal, 100 maternity, 708 infant welfare, 387 child welfare, 320 tuberculosis or tuberculosis contacts, 172 orthopedic, and 255 calls upon physicians in behalf of patients. The year's services will approximate 30,000.

This type of record can be duplicated in dozens of counties, and is cited as a concrete example of what can be done on a very reasonable per capita levy. In several of the southern states effective work is conducted on a much smaller budget, through the employment of units of smaller size. The extent of the work will necessarily be limited by the money available; but effective work is usually possible under a budget within the financial ability of the average county.

3. The average county is of a convenient size for one unit of staff to handle. Personal contacts can be established which permit even those activities which involve intrusion into private affairs. A fairly equal distribution of services is possible over an entire county, both urban and rural. In the county referred to, one-third of the home calls were made among the rural inhabitants, who comprise 62 per cent of the population, and probably one-half of the services have been directly for their benefit. Under no other system can rural districts share to such an extent in the benefits of organized health work.

4. The county system is advantageous over smaller areas in the handling of such matters as control of communicable disease, disposal of sewage, development of pure water and milk supplies, and prevention of stream pollution—all of which extend beyond legal boundaries.

5. Finally, as the county is a local area so far as government is concerned, popular interest in health work can be developed and capitalized, and coördination of county-wide private agencies interested in limited phases of health activities secured.

INHERENT ELEMENTS OF WEAKNESS

1. Vulnerability to political influence, which it shares with every other agency supported by public funds. The sinister influence of

politics is felt in every activity which involves important interests. Securing of sewage disposal plants, safeguarding of milk supplies, and food inspection, frequently involve financial loss to individuals; so there is almost sure to be a certain amount of opposition to such measures. It takes courage to work for measures designed for the public good in the face of opposition. Many a health officer is held back by the fear that his whole program will be jeopardized if he carries out his duties fully.

Specific instances can be cited illustrative of this point. A city passes regulations establishing certain minimum requirements as to milk, then proceeds to ignore them. An influential establishment maintains a malodorous plant which arouses bitter criticism on the part of neighboring citizens; yet for 10 years nothing is done to abate the nuisance. A judge or a lawyer owns houses and refuses to make sewer connections. A city pours its untreated sewage into a small creek in spite of the protests of riparian landowners. Many specious reasons can be advanced in extenuation of such conditions; but the real reason lies in politics. Boards of health do not feel that it is expedient to take the action which all admit is indicated. In numerous counties this sinister influence extends even to the appointment of members of the staff. Many health officers are handicapped by employees whose dismissal they are powerless to effect, because the storm which would follow, being localized, is likely to be violent.

Happily, with the increasing employment of well trained workers, the public is coming to appreciate the fact that health work is above politics, and, as between the advocate of special privilege and the conscientious health officer, its best interests lie in backing the department of health.

2. There are differences in practices prevailing among county health organizations. In the county system, the principle of decentralization is followed, and responsibility is placed upon the county officers, who carry out their programs according to their knowledge and ability, as affected by local conditions.

It is obvious that a health officer who is a political timeserver has little interest in any activity which jeopardizes his position, and that the untrained man will work less effectively than the trained. The result is great disparity in the effectiveness and nature of the work attempted. The solution will be expedited by greater supervision on the part of state departments of health.

However, the same disparity obtains as between state and city departments of health. One has but to scan the pages of *Municipal Health Practice for the Year 1923*,[1] based upon a study of 100 of the

largest cities in the United States, to see the chaotic condition which prevails in health practices. For example, scarlet fever has long been classified as a communicable disease. If isolation of cases is justifiable, it must be based upon scientific observations. Presumably such observations as to duration of transmissibility are valid regardless of location. Why, then, do isolation periods vary from 21 to 35 days, depending upon the residence of the patient? The absurdity of this situation is illustrated along the Ohio-Indiana boundary where families living on opposite sides of the same road have been placarded for periods of 30 and 21 days, respectively. It cannot be maintained that the boundary line has any influence upon the duration of the infective state.

Surely the time has come when health measures which are basically sound can be made more nearly uniform. Interstate agreements, and greater supervision over the county health services will be necessary to bring this about.

3. The county is too small for the proper handling of numerous important problems. If there were uniformity of practice among the counties, this would not be so serious. A county health officer found a case of typhoid fever on a dairy farm and he promptly stopped the sale of the milk in his own county; but the producer shipped it into the adjoining county. Several days later this came to the notice of the officer of the second county, who had to make a trip of 30 miles beyond his borders to protect his county. The probability is that the producer shipped into a third area, with no one the wiser. One county refuses a permit for the production of milk for sale in the county because of the bad state of the barn and the uncleanly manner in which the milk is handled. This is of no effect if, as at present, the producer can ship into a city with even more stringent regulations but not enforced. In the control of epidemics, and safeguarding of water supplies, the county is too small a unit, and state action appears to be absolutely necessary.

4. Being a local organization, it shares in the effects of intertown rivalry, in any antipathy between the rural and urban populations, in the outcry against increased taxation, in the vociferous opposition of individuals who develop personal dislikes toward members of the staff, in the whispering campaigns which abound in every small community. The only solution is the conscientious discharge of duty, exercise of patience and tact, constant effort to develop a public conscience as to public health, and the saving grace of humor.

In conclusion it may be pointed out that the strength inherent in county health organization far outweighs the weaknesses. There are

some counties too large for any single unit to handle satisfactorily, and others too small or too poor to permit the raising of the required funds. In some the roads make it impossible to distribute the services with any degree of uniformity. It is evident that such counties will require special adaptations to meet their several conditions. In the vast majority of the counties in this country, however, it would appear that adequate health work is possible of realization based primarily upon local support.

SUMMARY

1. Health work must be organized on a local basis to be adequate and enduring.
2. The elements of strength inherent in county health organization are:

   The county is the largest unit of local government; and offers precedents for such organization.

   It is a taxation unit, of sufficient resources to insure adequate funds.

   It is of a convenient size for one unit to handle.

   It offers advantages over smaller units in the handling of various health problems.

   It permits the development and capitalization of local interest in health work.
3. The weaknesses are:

   Vulnerability to political interference.

   Divergence of health practices.

   Being too small an area for handling certain important health problems.

   As a local organization, it is subject to strictures arising from provincialism.

REFERENCE

1. *Pub. Health Bull.*, *164*, July, 1926.

NOTE: The studies and observations on which this paper is based were conducted with the support and under the auspices of the International Health Division of the Rockefeller Foundation.

Carriers

THE New York State Department of Health has reported the discovery in 1928 in the upper part of the state, of 23 typhoid carriers—a total of 167 known, exclusive of those in state institutions. Forty-eight cases of typhoid fever were traced to these newly discovered carriers, who ranged in age from 15 to 68. Female carriers predominated, approximately 4 to 1. In all but 1 case, there was a history of a previous attack of typhoid fever. In 1, 37 years had elapsed, indicating the persistence of the carrier state over a long period. In 7, gall bladder operations were done with complete success, as indicated by laboratory examinations. These were released from restrictions.

Stability of Commercial Sterilizers in the Presence of Milk

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DUE to the increasing popularity of chemical sterilizers, much has been written concerning the uses of the hypochlorite and organic chlorine containing preparations. Those containing sodium hypochlorite seem to be most favored by the dairy and bottling industries. The so-called sodium hypochlorite sterilizers have neither the same composition nor the same degree of activity or stability. It is well known among chemists that the addition of sodium hydroxide to a sodium hypochlorite solution increases its stability to a marked degree. Some of the sodium hypochlorites on the market owe their stability to the high sodium hydroxide content; a notable example being antiformin.[1] One of the authors[2] observed that the stability of dilute solutions of sodium hypochlorite in the presence of metals could be greatly increased by the addition of less than 1 per cent of sodium hydroxide, tri-sodium phosphate or calcium hydroxide. The great stability of some of the commercial products is no doubt due to the addition of such compounds in excess during the manufacturing process, for their cleansing action, or to increase the chlorine capacity. R. L. Wells[3] found that the deterioration of the strong hypochlorite solution at room temperature varied greatly with the difference in composition, and that various salts may act as retarders or accelerators.

The stability of the sterilizer under plant conditions has received some attention. Levine, Toulouse, Peterson and Buchanan[4] found that a standard hypochlorite solution in distilled water suffered practically no loss, while with the addition of 1 per cent corn sugar there was a drop of about 67 per cent in the available chlorine in 1 hour at 79° F. Cane sugar was far less destructive.

In a study of the action of rubber on a commercial hypochlorite one of the authors[5] found that in 8 hours the hypochlorite suffered a 95.38 per cent loss of available chlorine, while in a so-called alkaline sodium hypochlorite a loss of but 80.4 per cent was noted.

Unlike the hypochlorites, the organic chlorine containing sterilizers, such as chloramine-T, are unusually stable. Leach[6] found that all the American made chloramine-T, dichloramine-T and other prep-

arations, were very stable, and their activity was greatly lessened by the slight increase of alkalinity.

The fact that in the dairy industry, sterilizers may come in contact with milk and milk products during their legitimate use seemed to warrant a systematic study of the effect of whole milk on the stability of commercial sterilizers.

REPORT OF EXPERIMENTS

The commercial sterilizers used are indicated by the numbers I, II, III and IV. I is a liquid sodium hypochlorite preparation, strongly alkaline with sodium hydroxide; II a liquid sodium hypochlorite; III a crystalline tri-sodium phosphate sodium hypochlorite preparation; and IV a chloramine-T preparation. Each sterilizer was diluted to a concentration equivalent to approximately 200 p.p.m. available chlorine.

For a series of determinations at a given temperature 500 c.c. portions were placed in sterile flasks partially immersed in a constant temperature bath; 1 c.c. of whole milk was added to each; and at definite time intervals determinations of the available chlorine were made. The loss in available chlorine was calculated in terms of p.p.m. and recorded as in Table I.

The stability of IV was so great that data for it are given only at 109.4°, 123.8° and 145° F. In all cases, IV was unusually stable;

TABLE I

STABILITY OF STERILIZERS IN THE PRESENCE OF MILK AT DIFFERENT TEMPERATURES. LOSS EXPRESSED IN PARTS PER MILLION (P.P.M.) OF AVAILABLE CHLORINE. 1 C.C. MILK ADDED TO EACH 500 C.C. STERILIZER

		Loss in Available Chlorine		
Temperature	Sterilizer	½ hr. p.p.m.	1 hr. p.p.m.	1½ hr. p.p.m.
73.4° F.	I	31.2	40.8	50.7
	II	45.3	56.4	64.8
	III	45.3	56.4	66.2
91.4° F.	I	56.4	70.5	90.2
	II	64.8	81.7	93.0
	III	65.0	79.0	93.0
109.4° F.	I	68.0	100.1	—
	II	90.0	110.0	—
	III	95.1	111.0	—
	IV	15.5	16.9	—
123.8° F.	I	88.8	131.4	—
	II	112.0	132.0	—
	III	122.0	141.0	—
	IV	16.9	17.9	—
145° F.	I	152.0	183.3	186.0
	II	148.4	169.2	180.8
	III	161.4	183.2	184.7
	IV	30.3	35.2	39.4

though a decrease in stability with rise in temperature and extended exposure was noticeable. For each sterilizer a definite, uniform decrease in stability with increase of time for any given temperature was noticed. As the temperature increased the rate of deterioration was accelerated. The rate of deterioration was found to be specific for each sterilizer. The order of increasing rate of deterioration of the three sodium hypochlorite sterilizers was found to be I, II, III.

From observations within the range of temperatures studied, it appears that the change in rate of deterioration due to increase of temperature is progressive. The importance of maintaining relatively low temperatures during the sterilization of dairy plant equipment seems obvious.

The above data emphasize the fact that sodium hypochlorite sterilizers may vary greatly in stability and activity. The user cannot be too strongly urged to consider carefully the conditions under which the sterilizer is to be used, as well as the properties of the various commercial products.

REFERENCES

1. Tilley, F. W. *J. Agri. Res.*, XX: 85, 1920.
2. Quam, G. N. Paper presented before the Iowa Academy of Science, May 4, 1928.
3. Wells, R. L. *Am. J. Pharm.*, 98: 404, 1926.
4. Levine, Toulouse, Peterson and Buchanan. *Beverage J.*, Feb., 1927.
5. Quam, Sidney N. Thesis, Iowa State College, 1927.
6. Leach. *Am. J. Pharm.*, 12: 592, 1923.

Publicity for Public Health

THE Illinois State Medical Society has upheld the action of the Chicago Medical Society in expelling Dr. Louis E. Schmidt. The charges on which this expulsion was based are "unethical advertising." It is reported that the action of both the Executive Council and the house of delegates of the state society was unanimous in its decision.

Dr. Schmidt had appealed from the action of the local medical society on the ground that it was not justified in holding him responsible for the advertising of the Chicago Public Health Institute, and furthermore that there was nothing unethical in the advertising of that organization.

It is expected that Dr. Schmidt will make a further appeal to the Judicial Council of the American Medical Association which will have to rule on the issue of whether it is ethical for the medical profession to advertise as a public health measure.

Rating Your Milk Supply

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WITH the ever increasing use of the Standard Milk Ordinance of the U. S. Public Health Service, a corresponding increase has been made in the application of its scoring system to the milk supply of various communities.

The federal system divides the milk supply of the community into three parts for scoring purposes:

A. Retail raw milk
B. Raw milk to plants
C. Pasteurized milk

To each is given a total of 500 points, so distributed as to cover every phase of production, handling, etc., according to the importance of each phase. The division score is obtained by enumerating the number of points actually earned out of the total possible 500, and from that determining the percentage of the 500 points that this represents. Such a procedure gives the three division scores which are essential for the determination of the general rating of the milk supply.

The problem now is to give a general score or a general rating, as it will hereafter be referred to, which will show on the basis of the three divisional scores to what degree the community has been successful in properly producing and properly pasteurizing its milk supply.

Herein lies the reason for this article—because it is the opinion of the writer that a formula now in use by the U. S. Public Health Service does not show what it is intended to show, and in some instances gives a false picture as to the correctness of production and the degree of perfection of pasteurization of the milk supply.

The U. S. Public Health Service formula is as follows:

$$GR = \frac{C \times A\% + D \times B\% + E \times B\%}{2}$$

where:
A = Gallons retail raw milk sold per day.
B = Gallons pasteurized milk sold per day.
C = Retail raw milk rating.
D = Raw milk to plant rating.
E = Pasteurization process rating.
GR = General rating.

The U. S. Public Health Service has issued a statement along with this formula stating that, " A 100 per cent general rating means that all of the community's milk supply has been both properly produced and properly pasteurized."

This statement is true when the general rating is 100 per cent, but it can easily be shown that for values less than 100 per cent the general rating, hereafter referred to as the G. R., is often misleading. The G. R. could only have a value of 100 per cent if there were no retail raw milk sold, and the raw to plant, and the plant process scores were both 100 per cent. This would make it practically an impossibility for a community to get a G. R. of 100 per cent. When only a fraction of the milk supply has been pasteurized, the smaller the fraction, the less is the accuracy of the G. R. Most community milk supplies have a very low G. R., usually less than 50 per cent.

The G. R. can be increased or decreased as much as 35 per cent, when the A–B–C score is 90–80–80, simply by increasing or decreasing the percentage of the milk pasteurized, without regard to the methods of production or pasteurization. Obviously, such a G. R. is useless as far as it shows the grade of production and pasteurization.

CHART I

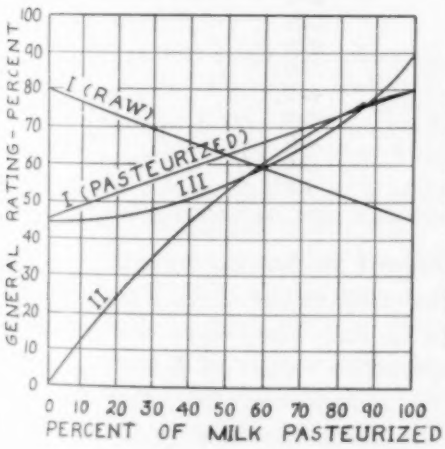
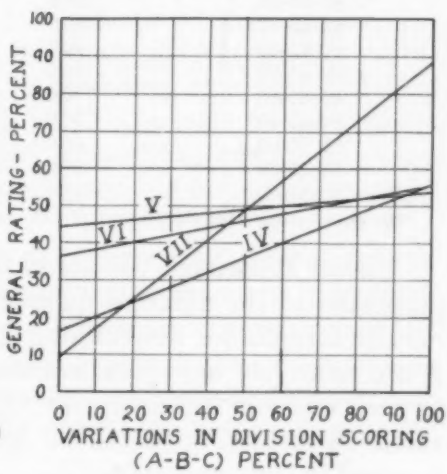


CHART II



I. Variation in per cent raw with constant A–B–C Score
I. Variation in per cent pasteurized with constant A–B–C Score
II. Variation in per cent pasteurized with A varying in the A–B–C Score
III. Variation in per cent pasteurized with B varying in the A–B–C Score
IV. Constant per cent pasteurized with A varying in the A–B–C Score
V. Constant per cent pasteurized with B varying in the A–B–C Score
VI. Constant per cent pasteurized (20 per cent) with B and C varying in the A–B–C Score
VII. Constant per cent pasteurized (80 per cent) with B and C varying in the A–B–C Score

Curve I (pasteurized), Chart I, shows the straight-line graph of increase in the G. R. when the percentage of milk pasteurized is regularly increased up to 100 per cent, and when the three division scores are 90–80–80. Hereafter the three division scores will be referred to as the A–B–C score. This curve shows an increase in the G. R. of 35 per cent. Curve I (raw) shows the opposite effect gained by increasing the percentage of raw milk in the community. It will be noticed that the G. R. regularly decreases as the percentage of raw milk increases up to 100 per cent.

In referring to the A–B–C score:

A = Retail raw milk score.
B = Raw to plant score.
C = Plant process score.

In all curves referred to hereafter the letters A, B and C are used as representing the A–B–C score apart from any system of notation used by the U. S. Public Health Service. An A–B–C score of 90–80–80 is used as representative of a very good score.

TABLE I

A–B–C Scoring	Per cent Pasteurized	Per cent Raw	General Rating
90–80–80	0.1	99.9	45.0
90–80–80	10.0	90.0	48.5
90–80–80	20.0	80.0	52.0
90–80–80	30.0	70.0	55.5
90–80–80	40.0	60.0	59.0
90–80–80	50.0	50.0	62.5
90–80–80	60.0	40.0	66.0
90–80–80	70.0	30.0	69.5
90–80–80	80.0	20.0	73.0
90–80–80	90.0	10.0	76.5
90–80–80	99.9	0.1	80.0

The general rating when the per cent of milk pasteurized is varied, the A–B–C score remaining constant.

Curves II through VII are of interest as showing something of the properties of the different quantities used in the U. S. Public Health Service formula for determining the G. R. They show that values of A are relatively unimportant compared to values of B and C, as far as their effect in increasing the G. R. is concerned, and that the chief factor in increasing the G. R. is the actual percentage of milk pasteurized in the community.

One can take an A–B–C score of 40–20–80 with the percentage of milk pasteurized as 20 per cent, and receive a G. R. of 26 per cent. Then simply by reducing the values of A and B one-half, giving an A–B–C score of 20–10–80, one can, by increasing the percentage of milk pasteurized 60 per cent, receive a G. R. of 38 per cent. In other words, it is possible in this instance to produce the community's milk supply only half as properly and yet receive a G. R. 12 per cent

TABLE II

A–B–C Scoring	Per cent Pasteurized	Per cent Raw	General Rating
40–20–80	20	80	26.0
20–10–80	80	20	38.0
80–60–80	20	80	46.0
40–30–80	80	20	48.0

This table shows that a milk supply having a production score (A–B) 50 per cent lower than another may receive a higher general rating simply by increasing the per cent of the milk supply pasteurized.

higher than before. Obviously a formula that will give such misleading values for G. R. is useless.

The second reason for this article is the suggestion of the use of another formula for determining the G. R.

Since the three A–B–C division scores were not affected by the amount of milk being pasteurized in the community, why is it necessary or logical to permit the G. R., which is a resultant of all three, to be affected by the percentage of milk pasteurized? If some other relationship were desired, it would be all right to consider the amount of milk being pasteurized, or any other value, for that matter; but we are interested in a general rating.

The G. R. is based on the A–B–C score. A 100 per cent G. R. should mean that all of the community's milk supply has been properly produced and that, if any of the milk is pasteurized, the process has been correct.

The objection might be raised at this time, and legitimately, to the use of the term " General Rating " in describing the result obtained by applying the U. S. Public Health Service formula to the community's milk supply. If the term is used, it should be qualified by some word showing it is really not a general rating but a " special rating," wherein pasteurization is stressed.

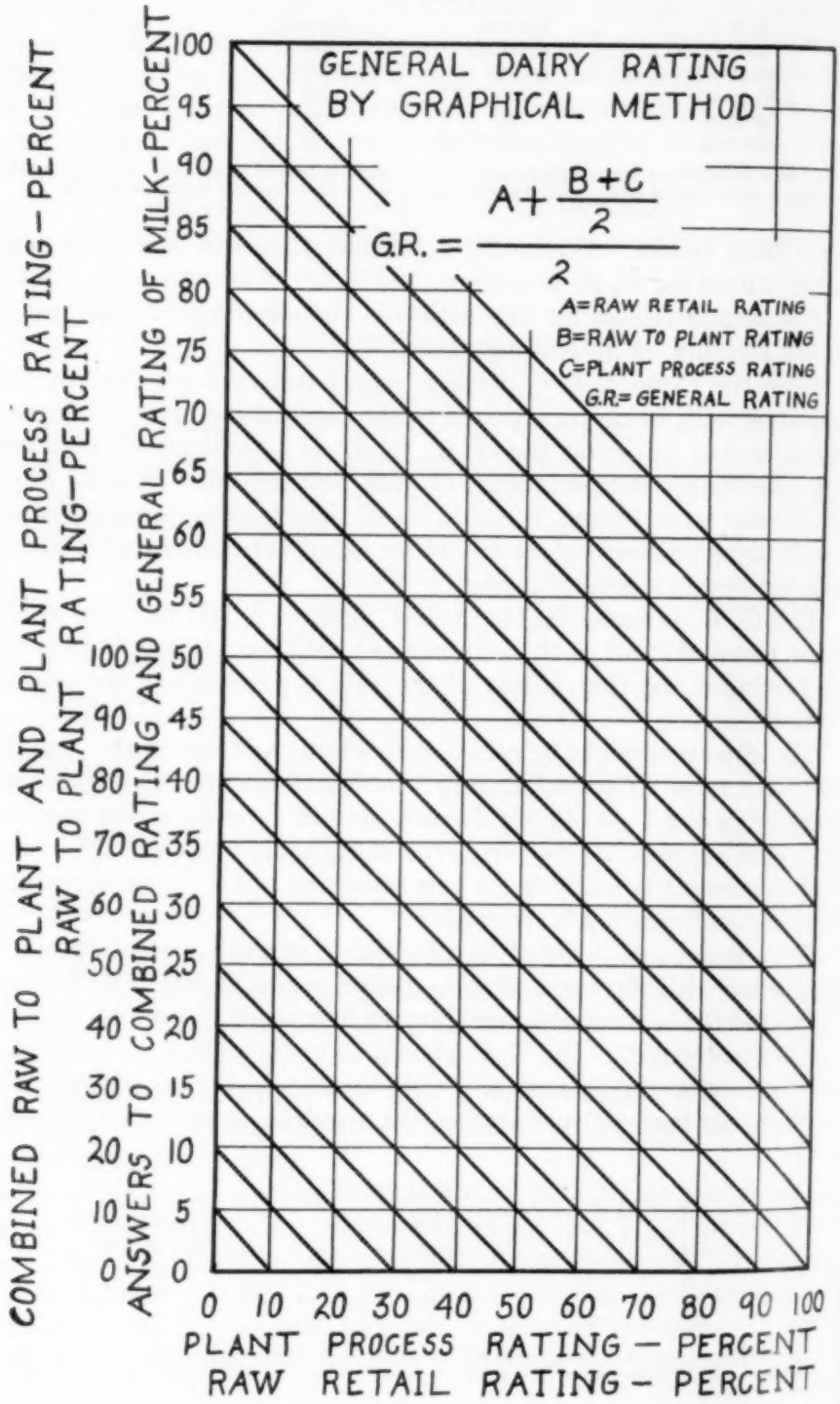
Two things are wanted by the dairy executive—the degree of compliance with the regulations as stated in the Standard Milk Ordinance, and the numerical figure showing how much of the community's milk is pasteurized. The G. R. should show the degree of compliance with the dairy regulations and only that. G. R. of 100 per cent should mean that 100 per cent of the regulations had been complied with.

TABLE III

City	Federal General Rating	General Rating New Method
A	53.1	70.7
B	50.5	72.5
C	45.7	73.7

This table shows that three cities, scored in 1928 by the U. S. Public Health Service rating formula, can be reversed in order of highest score by applying the new formula. This gives a truer picture of compliance with dairy regulations.

CHART III


GENERAL DAIRY RATING
BY GRAPHICAL METHOD
G.R. = A + (B+C)/2 / 2
A=RAW RETAIL RATING
B=RAW TO PLANT RATING
C=PLANT PROCESS RATING
G.R.= GENERAL RATING
COMBINED RAW TO PLANT AND PLANT PROCESS RATING—PERCENT
RAW TO PLANT RATING—PERCENT
ANSWERS TO COMBINED RATING AND GENERAL RATING OF MILK—PERCENT
0 10 20 30 40 50 60 70 80 90 100
PLANT PROCESS RATING — PERCENT
RAW RETAIL RATING — PERCENT

The following formula is suggested as one which will show the degree of compliance, one which will give a true, and not misleading, G. R.

$$GR = \frac{A + \frac{B + C}{2}}{2}$$

where: A = Raw to retail rating.
B = Raw to plant rating.
C = Plant process rating.
$\frac{B + C}{2}$ = Combined rating.
GR = General rating.

Three cities received a G. R. following an inspection by a federal officer. By applying the new formula, in which the percentage of milk being pasteurized has no effect, it was found necessary to reverse completely the order of cities (Table III) according to their G. R.

The third reason for this article is the suggestion of the use of a graphical chart for the solution of problems, given the A–B–C scores, to determine the G. R. The use of the chart will, where much statistical or comparative work is done, eliminate the tiresome arithmetical work. The directions for using Chart III are as follows:

TO DETERMINE COMBINED (RAW TO PLANT AND PLANT PROCESS) RATING

A. Read up left hand edge of chart and find line corresponding to raw to plant rating, which is outside line of figures.

B. Read across bottom edge of chart and find line corresponding to plant process rating.

C. Put a pinpoint where these two lines meet.

D. If it is on a diagonal line, the figure at the end of the line will indicate the combined rating, namely one-half of B plus C.

E. If the pinpoint is between diagonals, its distance from the diagonal line will indicate the fraction.

Example: Raw to plant rating ..... 61 per cent
Plant process rating ..... 53 per cent

The pinpoint comes between diagonal lines 55 per cent and 60 per cent. Answer is 57 per cent combined rating.

TO DETERMINE GENERAL RATING

A. Read up left hand edge of chart and find line corresponding to combined rating, which is outside line of figures.

B. Read across bottom edge of chart and find line corresponding to raw retail rating.

C. Put a pinpoint where these two lines meet.

D. If it is on a diagonal line, the figure at the end of the line will indicate the

general rating, namely one-half of the sum of the combined rating added to the retail raw rating.

E. If the pinpoint is between diagonals, its distance from the diagonal line will indicate the fraction.

Example: Combined rating ..... 57 per cent
Raw retail rating ..... 83 per cent

The pinpoint comes on diagonal line 70 per cent. Answer, general dairy rating is 70 per cent.

CONCLUSIONS

1. The federal general rating formula is too inaccurate and misleading to justify a continuance of its use.

2. A general rating should be based on the following only, without regard to the percentage of milk pasteurized:

Retail raw score
Raw to plant score
Plant process score

3. A general rating should show the degree with which the community complies with the regulations in the Standard Milk Ordinance.

RECOMMENDATIONS

1. That the use of the federal formula be discontinued.

2. That if the federal formula is retained, the resulting general rating shall be labelled something other than general rating, in order that it may be distinguished from a true general rating.

3. That a formula be used for determining the general rating which shall not involve the use of the percentage of milk being pasteurized.

4. That a formula shall be used that will show the degree to which the community complies with the regulations of the Standard Milk Ordinance.

NOTE: The writer wishes it distinctly understood that this article is in no sense an attack, personal or otherwise, on the U. S. Public Health Service.

Antituberculosis Vaccination in Italy

THE National Children's Bureau of Italy plans to introduce in 10 large cities optional antituberculosis vaccination of new-born infants.

According to the plan, the registrar of vital statistics in each city will report the births every day to the pediatric clinic of that city. The clinic will then send to the family a circular, with a reply card attached, explaining in simple language the reasons in favor of antituberculosis vaccination in cases where the child was exposed to contagion. If the parents agree, the child is given the vaccine. From that time on the child will be under the supervision of the clinic as long as this is considered necessary for its health.

The purpose of the work is to reduce the incidence of tuberculosis among infants and to ascertain more about the nature of the vaccine.

Sterilization of Milk Bottles in Soaker Type Washers*

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THE proper cleansing and sterilization † of milk bottles is receiving increased consideration by health authorities and is important in building up public confidence in the safety and healthfulness of milk as a food. Cleanliness and a reasonable degree of sterility of all equipment with which milk comes in contact is a prime requisite.

A tabulation of published reports of diseases traced to milk and milk products, by Armstrong and Parran,[1] shows 45 instances where infection of milk bottles has been reported as the factor causing the outbreak.

The Department of Health of Chicago in its supervision and control of milk bottle washing follows essentially the recommendations of the laboratory advisory board. These recommendations were formulated in 1926, after a preliminary field study made by the Bureau of Laboratories and Research.

In laying down basic principles for adapting mechanical and bactericidal methods to milk bottle washing, the board took the position that milk bottles, because of their extensive and constant contact with the general population, must be regarded as one of the most important potential factors in the spread of disease through milk supplies.

The primary objective, therefore, of regulations for the cleansing and sterilizing of milk bottles is the prevention of the spread of disease through milk.

The board was of the opinion that the destruction of the common pathogens which may be present in milk can be best assured by applying heat in excess of the known thermal death points of these organisms in milk at some time during the washing process. Recognizing that practical difficulties are encountered in applying this degree of heat consistently under all conditions, the board also ap-

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

† "Sterilization" as used in this article refers to disinfection rather than sterilization in the exact scientific sense.

proved the use of chlorine in the free or available state as an alternative in disinfection.

The board made the following recommendations:

1. That milk bottles be washed by soaking or agitation in a solution of free alkali, or other effective cleansing agent, in such a manner as to remove all visible foreign matter
2. That a dual temperature standard be set for washing milk bottles:
   a. *Soaker method*—Exposure during the soaking, washing or rinsing process to a temperature of not less than 165° F. for 5 minutes
   b. *Steam jet method*—Exposure during the process to a temperature of not less than 195° F. momentarily
3. That milk bottles washed at temperatures below those specified be subjected to a rinse of a chlorine disinfectant solution in a concentration of not less than 35 p.p.m. of available chlorine
4. That a bacterial count standard of not to exceed 1 per 2 c.c. of capacity be applied to milk bottles when the washing process is completed

In 1924, Whittaker, Archibald and Shere reported on the relative efficiency of sterilizing milk bottles by hand operated and hydraulic type bottle washers. It seemed desirable to make similar studies of the soaker type of washers now in use in Chicago and being installed in milk bottling plants, in order to test out the practicability of the advisory board's recommendations.

PROCEDURE

In these studies sample bottles were collected where possible at various stages during the cleansing and sterilizing processes, such as after soaking in caustic solution, after the brushing or pressure rinses, after plain rinsing and after sterilizing. The plating was done in the field within 5 minutes after the bottles were taken from the machine. As soon as a series of bottles was collected, the interior of each was rinsed with 20 c.c. of sterile water and the bacterial content was determined by the agar plate method as prescribed in the *Standard Methods of Milk Analysis,* American Public Health Association, 1927. From these results, the bacterial content per bottle was calculated by multiplying by 20.

In several tests, unwashed bottles were distinctively marked and contaminated heavily with a suspension of *B. coli;* these were placed in the bottle washer at the feed end and removed after passing through the soaker compartment. Marked, washed bottles were also contaminated in this manner and placed in the carriers just after emerging from the soaker solution and removed at the discharge end of the washer. Other marked bottles containing *B. coli* were inserted just before the bottles entered the final chlorine rinse. These bottles

immediately after removal were rinsed with 20 c.c. of sterile water and 1 c.c. planted in standard broth tubes and the presence of *B. coli* determined in accordance with *Standard Methods for the Examination of Water and Sewage,* American Public Health Association, 1925.

Nine different machines were tested at intervals over a period of 15 months. Bacterial counts were made on 1,885 bottles. Seven hundred and three additional bottles were tested also for the destruction of *B. coli.* During each test, determinations were made on the soaker solutions for carbonate and caustic alkalinity, also for residual chlorine in the sterilizing rinses. Temperature readings were made on soaker solutions and hot water rinses where used. The speed of operating each machine was determined. A study of the manufacturer's blue prints or cuts was made to determine the exact time of each stage of the process.

TABLE I

TREATMENTS TO WHICH BOTTLES WERE SUBJECT IN THE WASHERS TESTED

Machine	Pre-Rinse Seconds	Caustic Soak Min.	Caustic Rinses Tot. No.	Caustic Rinses Tot. Sec.	Brush and Plain Rinses Tot. No.	Brush and Plain Rinses Tot. Sec.	Steam Jets Tot. No.	Steam Jets Tot. Sec.	Tri-Sodium Phosphate Rinses No.	Tri-Sodium Phosphate Rinses Sec.	City Water Rinses No.	City Water Rinses Sec.	Chlorine Rinse Drain Tot. No.	Chlorine Rinse Drain Tot. Sec.	Chlorine Rinse Drain Period Sec.	Alkalinity Soaker Solution Carb. Per Cent	Alkalinity Soaker Solution Caustic Per Cent	Av. Temp. Soaker Solution ° F.	Chlorine Solution Av. P.P.M.
I	0	8.3	0	—	2	15	0	—	0	—	4	30	2	15	57	1.81	1.80	117	16.9
II	100	8.3	0	—	2	15	0	—	0	—	3	22	2	15	90	3.34	4.37	129	15
III	8	7.7	0	—	0	—	2	16	4	32	2	16	0	—	80	2.18	3.27	139	None used
IV	0	11.8	0	—	0	—	0	—	0	—	0	—	2	14	21	3.44	4.33	152	3.0
V	0	8.3	4	36	0	—	0	—	6	216	2	18	1	9	36	0.85	2.10	140	126.0
VI	105	6.0	6	90	0	—	0	—	0	—	3	45	2	30	135	0.80	1.80	140	40
VII	9	6.0	2	18	2	18	2	18	0	—	2	18	0	—	135	0.90	1.75	140	None used
VIII	0	20.0	0	—	0	—	0	—	0	—	5	40	0	—	88	1.60	2.10	153	None used
IX	0	10.6	3	33	0	—	0	—	0	—	3	33	1	11	99	0.89	1.40	119	17.4

The different treatments provided by the machines and length of time of each are given in Table I. The principal differences are in number of soaker compartments, whether soaking is followed by a pressure rinse of caustic solution or by brushing, whether final sterilization is provided by heat or chlorine, and in the length of time provided for the various operations. Variation will be noted also in the strength and average temperatures of the soaker solutions and the strength of chlorine solution.

RESULTS

The results of the bacteriological examination of the bottles collected at various stages in the machines are given in Table II under the headings " Average Counts," and " Per cent under 500."

Considering first the bottles collected as they emerged from the *soaker solution,* it will be noted that in one of the nine series, all of the bottles had counts under 500. The percentages on the other runs were: 99 (2), 96, 94 (2), 82, and 76.

TABLE II

RESULTS OF BACTERIOLOGICAL EXAMINATION OF MILK BOTTLES COLLECTED AFTER RECEIVING VARIOUS TREATMENTS* IN SOAKER TYPE BOTTLE WASHERS

Test Run No.	No. Bottles Tested	Soaker		*B. coli*		Caustic Rinse or Brush		Plain Rinse		Sterilized Bottles		*B. coli*	
		Per Cent under 500	Av. Count	No.	Results	Per Cent under 500	Av. Count	Per Cent under 500	Av. Count	Per Cent under 500	Av. Count	No.	Results
1	159	76	5,458	80	0	68	853	77	782	100	23	73†	0
2	480	100	35	96	0	94	149	83	230	99	21	96†	0
3	361	99	39	—	–	100	14	100	21	99	43	—	–
4	450	99	59	—	–	—	—	—	—	97	155	—	–
5	68	94	120	45	0	—	—	—	—	100	25	45‡	0
6	71	—	—	—	–	—	—	—	—	100	30	—	–
7	69	82	364	44	0	—	—	—	—	100	21	44‡	0
8	149	96	93	48	0	—	—	—	—	100	29	48‡	0
9	78	94	59	44	0	100	11	—	—	100	14	40‡	0

* Where no samples are shown the construction of machine rendered it impractical to collect bottles at these points.

† *B. coli* contaminated bottles placed in machine to receive chlorine rinses only.

‡ *B. coli* contaminated bottles placed in machine to receive all treatments except soaking.

Considering the bottles as delivered by the machine after soaking, rinsing and sterilizing, in six of the nine series all of the bottles had counts under 500; two, 99 per cent; and one, 97 per cent. These results were considered as satisfactory compliance with the bacterial count standard recommended by the advisory board.

All bottles contaminated with *B. coli* gave negative results after being subjected to soaking or rinsing and sterilizing.

CONCLUSIONS

Field tests and observations revealed that all of the types of soaker bottle washers now in use have either provided, or can readily provide, for sterilization in a manner meeting the recommended standards, namely: exposure to 165° F. for 5 minutes, or 195° F. momentarily; or rinsing in a solution of chlorine disinfectant in a concentration of not less than 35 p.p.m. of available chlorine.

In certain instances, these observations further showed the necessity of improved plant control to make sure that the standards would be properly met. Therefore, on machines providing heat sterilization the installation of temperature control apparatus was recommended and secured; on machines providing chlorine sterilization, the plants were required to provide orthotoluidine testing kits, and the bottle washer operators were instructed to check the available chlorine at frequent intervals to assure proper dosage at all times.

REFERENCES

1. Armstrong, Chas., and Parran, Thomas, Jr. Further Studies on the Importance of Milk and Milk Products as a Factor in the Causation of Outbreaks of Disease in the United States. *Pub. Health Rep.* 62, *Supplement*, 1927.

2. Whittaker, H. A., Archibald, R. W., and Shere, L. Relative Efficiency of Methods of Sterilization of Milk Bottles at Pasteurization Plants in Minnesota. *Pub. Health Rep.*

Detergent Properties of Alkaline Dairy Washing Compounds*

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TO quote that modern classic *Fundamentals of Dairy Science:*[1] "While dairy utensils are in no sense a natural habitat of bacteria, a great many organisms grow on the surfaces of such equipment so that the utensils form an important source of bacteria in milk. As a general rule, in fact, under ordinary farm conditions where steam is not available for sterilizing purposes, more bacteria gain access to milk through utensils than from any other sources." These conclusions can truthfully be supplemented with the observation that the farmer is not the only offender in this matter.

Some of the present methods of dairy sanitation fail to give cleanliness consistent with quality standards. Cleanliness is the exception and not the rule. The presence of oily films in pipe lines, utensils, pasteurizers, holding and mixing tanks, valves and the like, can readily be detected by the finger. Wherever intense heat (particularly steam) is applied to any surface in contact with milk for an appreciable period of time, a calcareous deposit known as "milk stone" forms, which continued applications of some washing compounds fail to remove. Such surfaces are not clean and can be the sources of trouble because they provide culture medium for bacteria which may gain access between the washing and sterilizing and the passage of fresh milk.

When such conditions become troublesome, it is sometimes the practice to apply copious amounts of some chlorine disinfectant, which may be antiseptic for short periods but never germicidal, since their disinfecting properties are destroyed through chemical combination with the adhering milk solids, and the condition remains to cause future trouble. These statements, however, must not be interpreted as a condemnation of the use of chlorine disinfectants, but rather as a warning for their intelligent application.

These failures to obtain cleanliness certainly are not due to dairy

* Read at a Joint Session of the Laboratory and the Food, Drugs and Nutrition Sections of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 15, 1928.

engineering, for on every hand there are appliances that should insure clean equipment and utensils. One of the most striking examples is the soaker type of bottle washer, a heritage of the brewery, yet efficient. Apparently the advances in dairy sanitation made during the past few years have been due to the contributions of engineers. On the other hand, the washing compounds so necessary to obtain cleanliness are practically the same as they were ten or even twenty years ago. Why? Possibly their inadequacy is due to failure to determine the fundamentals and to select chemicals that can meet the demands made upon them.

THE GERMICIDAL PROPERTIES OF ALKALIES

A dairy detergent must be an efficient germicide and also an effective cleansing agent. During recent years considerable attention has been given to the germicidal efficiencies of the alkaline washing compounds. Research has indicated that hydroxyl ion concentration is an important factor in the germicidal action of such compounds. This was first indicated in the work of Myers[1] and later substantiated in studies on the effect of alkali solutions on bacteria found in unwashed milk bottles by Mudge and Lawler.[2] On the other hand, work by Levine, Buchanan and coworkers has indicated that germicidal efficiency, while a direct function of the hydroxyl ion concentration, does not depend upon the degree of alkalinity alone. As the result of a study upon the germicidal efficiency of sodium hydroxide, and of sodium hydroxide-carbonate mixtures at the same hydroxyl ion concentration, these investigators suggest that the undissociated sodium hydroxide rather than the hydroxyl ion concentration might be the controlling factor in germicidal efficiency.[3] Considerable support was given this theory in their later study wherein the addition of various salts to sodium hydroxide markedly increased its disinfecting properties.[4] Their results, however, are more particularly applicable to problems where considerable concentrations of caustic can be utilized—a practice that must be avoided in a majority of dairy cleansing operations due to its corrosive action upon metals and danger of injury to individuals who may come in contact with it.

It will be found in practice that where the relatively non-corrosive alkalies are used their concentrations generally are doubtful factors in germicidal activity. It is therefore possible that more attention to the hydroxyl ion concentrations of such solutions might prove of considerable value as a public health measure. Yet, while this research has been fundamental, it has not solved the problem. The bactericidal effect of a dairy detergent is of paramount importance; yet its cleansing

properties are equally as vital, for unless the contact surfaces are free from all traces of adhering milk particles, a source of future contamination remains. Aside from the colin-aerogenes types, the alkali formers, miscellaneous non-spore-forming rods, and several species of micrococci which have been found associated with dairy utensils and equipment, there are instances where spore-forming bacteria have been added to milk in significant numbers from pasteurizing equipment because inadequate cleansing permitted their growth in the milk solids which had cooled on the exposed surfaces.[6]

DAIRY CLEANSING PROBLEMS

In dairy cleansing problems, there are normally three classes of "dirt" that a detergent has to remove: (1) particles of dirt or milk solids held to the surfaces by an oily or greasy binder of milk fat; (2) the dirt or milk solids held by adsorption to the surfaces; (3) the "milk stone" deposits accumulated on surfaces subjected to intense and intermittent heat applications.

THE ELIMINATION OF FATTY FILMS

The emulsification of the milk fat will break the binder holding the entrapped particles and render their removal (as well as that of the dispersed fat) by rinsing an easy matter. Soap solution possesses cleansing properties of this character but is inadequate because of precipitation and other chemical reactions. Of the alkalies commonly used in dairy washing compounds, sodium hydroxide, tri-sodium phosphate, sodium carbonate and bicarbonate constitute the bulk of the supply. Caustic soda because of its corrosive nature is objectionable and its applications are limited.

When melted milk fat is added to tepid water and shaken vigorously, droplets of fat form, which quickly join together as a layer of fat on the surface. If a 1 per cent aqueous solution of tri-sodium phosphate is used, a more or less opaque mixture results, and not until several minutes have elapsed will a film form at the surface. When chemically pure sodium carbonate or bicarbonate is used, almost immediately droplets of milk fat larger than those discernible in the phosphate solution will rise to form a film. A mixture of c.p. sodium carbonate and tri-sodium phosphate, as well as commercial products containing these two, will dissipate the emulsifying property of the phosphate at the expense of the carbonate.

By adding equal quantities of melted milk fat to given aliquots of 1 per cent aqueous solutions of the alkalies to be tested, at a constant temperature, it is possible to evaluate relative emulsifying properties

by measuring the size of the droplets rising to the surface, and determining the time consumed in forming fat layers of uniform thickness. In the author's experience 45° C. is the most practical temperature for these tests. It is suggested that the water supply used in the washing operations be used as the solvent in order to approximate practical conditions.

The author's experience is that crystalline tri-sodium phosphate is the most efficient of the alkalies studied. Mixing this with sodium carbonate or bicarbonate, or using mixtures containing them invariably dissipated the emulsifying properties of the phosphate. Sodium hydroxide gave the same results.

THE SUSPENSION OF DIRT PARTICLES

The removal of adherent dirt particles and milk solids can best be accomplished by their suspension in the detergent solution. While soap solutions owe their cleansing power in part to this property of colloidal suspension (i.e., adsorption), their use is limited because of the difficulties mentioned above.

If finely divided charcoal (freed from oil or grease by washing with ether) is added to water and shaken, it settles. If a 1 per cent aqueous solution of c.p. tri-sodium phosphate or sodium hydroxide is used, the charcoal will remain in suspension and the liquid will resemble ink. The particles of carbon are so fine that instead of forming a precipitate, they attach themselves to the alkalies and remain suspended. This action looks like disintegration but is not. If a suspension of carbon black in water is filtered several times through paper, the water will finally run through clear, while the carbon black will be held back. If a solution of sodium phosphate or hydrate is then poured on the filter, a black filtrate is obtained and the paper becomes clean. The cellulose adsorbs the carbon black and clogs the filter so that the pores are not large enough to let the remaining particles through. The alkali solutions remove the carbon black because it is more strongly adsorbed by them, and, therefore, goes through the paper. That this is the explanation can be shown in three ways: (1) The experiment does not succeed if the carbon black is too coarse; (2) if the black filter paper is reversed and washed with water, it will remove only the carbon black that is not in immediate contact with the paper; (3) microscopic examination of the black filtrate will reveal the presence of charcoal particles.

The adsorption of carbon black by filter paper offers a means of determining the relative dirt suspending powers of alkaline washing compounds. If a strip of filter paper is dipped into an aqueous sus-

pension of carbon black, the charcoal will not spread appreciably although the water will rise over a considerable area. If, however, a strip of filter paper is dipped into suspension of carbon black adsorbed by an alkali, the charcoal will spread nearly as far as the liquid, because it is more strongly adsorbed by the alkali than by the filter paper. By dipping uniform strips of filter paper into comparable test suspensions of carbon black for a given period of time, we have a means of evaluating the relative dirt suspending powers of the different detergents being studied. No particular attention need be given the temperature except that it is constant in all the tests. The filter paper should just touch the surface of the test suspension. A detergent solution which gives an area of blackness on the filter paper equal to that of adsorbed liquid is more efficient than one which gives a fainter color or a smaller black area.

It has been found that c.p. tri-sodium phosphate crystals proved superior as a suspensory agent. Sodium hydroxide was practically as efficient as tri-sodium phosphate. Sodium carbonate and bicarbonate were markedly inferior to these two alkalies. Mixing the chemically pure phosphate or hydrate with either the carbonate or bicarbonate decreased the adsorption properties of the former. Commercial products containing mixtures of the phosphate or hydrate with the carbonates produce suspensions inferior to those of the c.p. phosphate or hydrate but superior to those of the c.p. carbonate or bicarbonate.

THE PREVENTION OF " MILK-STONE " DEPOSITS

While the calcareous deposit of so-called " milk stone " has been considered as a third class of dirt encountered in dairy cleaning problems, it is more properly the product resulting from the reaction of certain constituents of commercial washing compounds with the calcium salts found in " hard " water, but involving the protein of milk, which apparently hastens its formation.

The first explanation for the formation of this shell-like incrustation is found in the well known treatment of " hard " water whereby calcium carbonate is precipitated by the addition of sodium carbonate. This, however, does not account fully for this formation, as casein is precipitated by calcium salts such as are found in " hard " water. Slightly sour milk coagulates upon boiling, which explains the formation of the original coagulum found on pasteurizer coils. Apparently a localized acidification aided by the intense heat is the contributing factor. Casein, not unlike charcoal, is peptized by alkalies. The peptizing action of the alkaline earths is less marked than that of the alkalies because the adsorption of the bivalent cations cuts down the

peptizing action of the hydroxyl. When peptized by hydroxyl, casein is precipitated by calcium salts.

In view of these facts and their relation to the problem of dairy detergency, involving as it does the use of " hard " water containing calcium salts varying with the locality, a few experiments with casein were undertaken. Since in practice the milk coagulated on the surfaces of pasteurizers, coils, etc., represents a relatively high concentration of casein, tests were conducted using as high as 1 gm. of purified casein with only 50 c.c. aliquots of 1 per cent aqueous solutions of the various alkalies and commercial products studied. In all of these experiments large test tubes with their contents were heated to 180° F. and agitated gently before any observations were noted. In this way it was assumed that the soaking of equipment to be cleansed would be approximated.

It was found under the conditions of these experiments that c.p. caustic soda formed an apparent solution with casein while crystalline tri-sodium phosphate peptized most of the casein with the formation of a flocculent precipitate that settled only as the temperature was lowered. The carbonate and bicarbonate produced a less marked peptization with the formation of a sandy precipitate. These experiments were then repeated with the addition of very small and uniform amounts of calcium sulphate (approximately 0.03 per cent) in order to establish an exaggerated and artificial " hard " water condition. While similar results were obtained as regarded the peptization of the casein, the tubes containing the hydrate, carbonate and bicarbonate had turbidities that were not detected in those containing the phosphate. Upon the completion of these tests, it was noticeable that the tubes containing the bicarbonate and carbonate solutions were coated on the inside with a rough calcareous deposit resembling " milk stone." Vigorous rubbing failed to dislodge this incrustation but it was readily dissolved by hydrochloric acid. Furthermore, soaking these tubes with hot solutions of phosphate after first removing all superficial material by thorough rinsing soon made it possible to remove such deposits with a little brushing.

While the adsorption of hydroxyl ion accounts for the degree of peptization of casein by the alkalies studied, it is difficult to explain its apparent protective colloidal action in the presence of phosphate and its precipitation by the calcium sulphate in the carbonate and bicarbonate solutions. It is possible that in the phosphate tests, a colloidal solution of calcium phosphate was formed through its adsorption by the casein. Carbon black is similarly adsorbed by casein and more strongly so than any of the alkalies studied.

It was found in these experiments on " milk stone " that only crystalline tri-sodium phosphate would prevent its formation. Mixing this with any of the other alkalies, as well as using commercial products containing mixtures of these alkalies, would invariably result in the formation of " milk stone."

DISCUSSION AND SUMMARY

While the few experiments outlined are concerned primarily with detergency from the standpoint of the elimination of " dirt," there is another phase which has not yet been properly investigated. It is conceivable that the phenomena of emulsion and adsorption increase the penetration of the germicidal substances to the bacteria entrapped in greasy films or adhering to " dirt " particles and the equipment. In addition, spore-formers or other resistant microörganisms might possibly be eliminated if adsorbed either by the detergent solution or by " dirt." Some indications of this were seen in the results of an investigation of a colloidal alkali mixture used in cleaning milk bottles.[6] It was demonstrated in field experiments with an automatic bottle washer, that a colloidal-alkali mixture containing caustic soda was more effective germicidally than caustic soda used alone. Thus it appears that the " availability " or " penetration " of the lethal agent increases germicidal efficiency.

From the reported observations upon the detergency of the alkalies and commercial products, it has been indicated that crystalline tri-sodium phosphate has chemical and cleansing properties which particularly recommend it for use in dairy detergency. Mixing the phosphate with carbonate or bicarbonate is objectionable as such admixtures will diminish its emulsifying properties; reduce its power of adsorption; and induce the formation of " milk stone."

It appears from the results obtained that chemical purity is vital if consistent cleansing action is to be assured. Apparently the satisfactory method for preparing a dependable dairy detergent involves the synthesis of chemicals possessing a degree of chemical purity formerly regarded as unnecessary. If dairy cleansing processes are to acquire a stability now lacking in most instances, it is essential that the same discrimination be exercised in the selection of the detergent as in choosing the alkalies used in baking powder in contrast to those used in an agricultural fertilizer.

REFERENCES

1. Myers, R. P. *J. Bact.*, XV, 5: 341–356 (May), 1928.
2. Mudge, C. S., and Lawler, B. M. *J. Indust. & Eng. Chem.*, XX, 4: 378–379 (Apr. 1), 1928.
3. Levine, M., Peterson, E. E., and Buchanan, J. L. *J. Indust. & Eng. Chem.*, XX, 3: 63–69 (Jan.), 1928.
4. Levine, M., Toulouse, J. H., and Buchanan, J. H. *J. Indust. & Eng. Chem.*, XX, 2: 179 (Feb.), 1928.
5. Fundamentals of Dairy Science—A. C. S. Monograph No. 41, page 246 (1928).
6. Parker, M. E., and Smith, H. K. *Proc. Am. Assn. Med. Milk Com.*, 155–169, 1927.

Results Obtained in Phenolic Wastes Disposal under the Ohio River Basin Interstate Stream Conservation Agreement*

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PHENOL and other tarry acids, the sources of great annoyance in water supplies, originate in the coking of coal. This enterprise is as old as the manufacture of steel; and coking follows steel manufacture in the growth of its importance.

Twenty-five years ago practically all coke was made by the beehive process. No effort was made to recover by-products; hence there were no problems incident to recovery and refinement of coal gas and coal tar products. A few years prior to the outbreak of the World War the situation began to change. Steel companies began installing ovens of the by-product type, and many millions of dollars worth of by-products formerly consumed and wasted were salvaged, chiefly ammonia, tar, benzol, naphthalene and toluol solvents.

Following 1914, a great impetus was given the industry, through the loss of shipments from Germany, and the manufacture of war materials demanding many ingredients derived from coal tar products. All coke ovens built in the last 10 years are of the by-product type; and fully 75 per cent of coke manufactured is from the by-product oven.

LOCATION OF BY-PRODUCT COKE WORKS

Because coke is utilized largely for supplying carbon in the manufacture of steel, coke plants are largely located near iron and steel centers. The steel industry selects its location for the minimum transportation expense of both raw and finished materials. Coal is a most important raw material. The most notable of these centers is the Pittsburgh district, embracing the upper Ohio River valley, western Pennsylvania, and northeastern West Virginia. The Youngstown district, also on the Ohio River drainage area, is an important location for this industry. Two other large centers are the Cleveland district in northeastern Ohio on Lake Erie, and the Chicago district at the southern shore of Lake Michigan. Proximity by way of easy transportation to the iron ore, and easy reach to the markets for the finished steel product, have made for the rapid and extensive development of these two centers of the steel industry.

A number of factors have influenced the locations of the newer by-product coke plants that are not associated strictly with the manufacture of steel. Manufacture of domestic coke, favorable sale of fuel and illuminating gas, and cheap transportation of high-grade coal are the more important influences. A center of such char-

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

acter is located on the Ohio River in the vicinity of the junction of West Virginia, Ohio, and Kentucky. It is also probable that with the decline in the supply of natural gas in this region a more intensive development of the by-product coke industry will take place.

SOURCE OF PHENOLIC WASTES

Liquid wastes result from the coking of coal and the recovery of by-products in the following manner: The hot gases driven from the coal during coking must be cooled before the product may be utilized for fuel or illuminating purposes. In the coking process a condensate of water, ammonia, oil and tar is produced.

The most common type of by-product coke plant employs the indirect method whereby the cooling water is circulated in pipes around which the hot gases pass to form a condensate which is then removed for refining of valuable constituents. Further cooling and refining follows when the gas is bubbled through sulphuric acid where the free ammonia is transformed into ammonium sulphate. Final cooling and refining of the gas is afforded by a direct scrubbing with cool water followed by a direct scrubbing with cool oil, whereby the benzol, naphthalene and light oils are removed from the gas. The condensate from the preliminary cooling of the gas is treated with lime and distilled for the additional production of ammonia. This type of plant is usually designated a sulphate plant, owing to the manner in which the ammonia is recovered and marketed. It is the residues from the ammonia stills that contain the phenolic substances which must be disposed of.

The other type of by-product coke plant, less common than the above, differs in process by the employment of direct scrubbing with water for gas cooling and refining and for production of ammonia. After separation of tars and oils by gravity, the entire volume of cooling water thus becomes weak ammonia liquor and must be distilled for concentration of the liquid ammonia. The tars separated from the scrubbing of the gases are treated with lime; and, combined with the residue from the free ammonia still, are further distilled to procure the fixed ammonia. This type of plant is ordinarily designated a liquid ammonia plant, because all the ammonia is recovered and marketed as aqua ammonia. Again, the residues from the ammonia stills, which contain the phenolic substances, must be disposed of. An important item of note is that the volume of still wastes to be disposed of in this process is greater, perhaps 3 to 4 times that of the sulphate plant.

Until comparatively recent years it was the general practice to discharge these still wastes untreated, directly into the rivers, streams, and lakes adjacent to the by-product coke plants. In numerous instances these bodies of water were the sources of public water supplies, in such close proximity as to be affected thereby and become the objects of serious complaint.

EFFECT OF PHENOLIC WASTES UPON PUBLIC WATER SUPPLIES

Phenolic substances, even when present in minute amounts, impart to water a taste and odor that may be decidedly objectionable. When unaffected by other chemical agents these phenolic substances give to the water a " carbolic " or medicinal flavor. In contact with chlorine, used extensively in water purification practice, the chloro-phenol gives to the water a sort of iodoform taste and odor even more objectionable and far reaching. Observers are generally agreed that these tastes and odors are developed with the phenolic wastes in contact with ordinary filtered and chlorinated water in dilutions as great as 1 part of phenol to 50 million parts of water.

From a public health standpoint these phenolic wastes may possibly have the following ill effects: (1) The presence of phenol in drinking water may exert directly a deleterious effect upon the health of persons using such water (Elyria and East Liverpool, O.). (2) The existence of an offensive taste and odor discourages the use of water for drinking in the amounts necessary to promote health. (3) The existence of such tastes and odors likewise encourages the use of other sources of water supply which, while of pleasing physical quality, may be contaminated and unsafe (Ironton, O.). (4) The fact that chlorine treatment of a public water supply intensifies the tastes and odors, may result in a reduction of the amount of chlorine used or the total suspension of the chlorine treatment and consequent failure to secure sufficient disinfection.

Early experiences with phenolic tastes and odors in drinking water supplies resulted of course in much embarrassment to water works officials charged with the duty of furnishing pure and potable water to the public. Every effort was made to find some method adapted to water purification practice whereby the phenolic substances could be successfully modified or removed. Very little or no success has attended the years of constant research along these lines. A certain degree of relief from the intermittent occurrences of phenolic tastes has been attained at those places where the most elaborate and double treatment devices permitted temporary cessation of chlorination in the water purification process; or where lime softening could be substituted for chlorination to bring about the disinfection of the water supply. However, if the concentration of the phenolic wastes became great enough, the tastes and odors again were the source of complaint. The margin between the amount that would only cause trouble in contact with chlorine and that which would alone be objectionable was not enough to make dispensing with the use of chlorine in water treatment practice a satisfactory solution to the problem.

EXPERIENCES WITH PHENOLIC WASTES AND EARLY EFFORTS OF INDUSTRY TO ERADICATE THEM

From the foregoing remarks concerning the history and location of the by-product coke industry, it is not surprising that the first difficulties incident to disposal of wastes from this class of industry originated in the upper Ohio valley. One of the earlier cases on record was at Newcastle, Pa.[1] In December, 1912, the city experienced a severe occurrence of phenolic tastes and odors in the public water supply lasting six or seven weeks. Legal proceedings were instituted by the Newcastle Water Company against the Carnegie Steel Company of Farrel, Pa., which resulted in a financial settlement and an agreement on the part of the steel company to prevent further disturbance. The objectionable wastes were eliminated by the installation of a coke quenching system completely utilizing these wastes.

At Johnstown, Pa., the Cambria Plant of the Bethlehem Steel Company, at the instance of the Pennsylvania Department of Health, installed, early in 1916, a quench system to dispose of the phenolic wastes in order to protect the Conemaugh River, a tributary of the upper Ohio, from which stream the city took its public water supply.

Likewise at Clairton, Pa., the Carnegie Steel Company installed, in 1918, a quench system for eliminating the phenolic wastes from the Monongahela River, also in the upper Ohio River valley, from which McKeesport, Pa., takes its water supply a few miles downstream from Clairton. The installation at Clairton serves the largest by-product coke plant in the world, the coal coking capacity at this

works being 30,000 tons per day, or about 6 times that of a plant ordinarily considered a large one.

Other cities in the country experienced periods of marked phenolic tastes in public water supplies in early years. As early as 1917 Cincinnati complained of this trouble and in 1918 and 1919, Morgantown, W. Va., Youngstown, O., Louisville, Ky., and other Ohio River cities also began to complain. Outside of the Ohio River drainage area bad reports were heard—Milwaukee, Cleveland, Rochester, Buffalo, and more recently Chicago and the other cities in the southern Lake Michigan district.

The Cleveland experiences of 1922 and 1923 were particularly aggravating, and culminated in the installation of quench systems for the elimination of phenolic wastes by three companies, the American Steel & Wire Company, the McKinney Steel Company and the Otis Steel Company. All three formerly discharged untreated wastes into Cuyahoga River, which entered Lake Erie a few miles from Cleveland's water intakes.

APPLICATION OF INDUSTRIAL SCIENCE TO THE PROBLEM

The so-called quench system, while seemingly quite simple, and satisfactory from the standpoint of protecting water supplies, is far from satisfactory to industry. The initial expense of installing the quench system for a new by-product coke plant is negligible, merely that of arranging the sewer system on the separate plan whereby all phenolic waste waters flow to a central sump or storage basin from which they are pumped to the coke quenching tower. For a by-product coke plant already established it may mean a very considerable expense to rearrange the sewer system, often involving the pumping of the flows two or more times. At one plant of the Youngstown Sheet and Tube Company this initial expense of rearrangement cost in the vicinity of $250,000 for a coke plant of 5,000-ton daily capacity.

The maintenance of a quench system is costly. The phenolic wastes are corrosive, and attack the metal piping and pumping equipment, also the quench tower metal parts, quench cars, tracks, and draining platforms. The life of the equipment, variously estimated at 7 to 10 years when using clean water for quenching, is cut to 2 to 4 years when using phenolic wastes. At the largest by-product coke plant in the world, Clairton, Pa., with a 30,000-ton daily coking capacity, the maintenance expense averages $60,000 annually.[2]

The quenching system is chiefly objectionable to industry because of the bad effects of the phenolic wastes upon the coke produced. In spite of a considerable volume of clean make-up water being required daily, an objectionable phenolic odor is imparted to the coke thus quenched, making it unfit for the domestic trade; that is, the customers simply will not stand the odoriferous material in their cellars. In the case of the liquid ammonia type of plant, where the total volume and amount of phenolic materials are from three to four times that of the sulphate of ammonia type, it becomes difficult to use up all of the liquid by the quench operation; with the result that the coke receives a stronger odor and is made soggy with moisture. The excess of moisture impairs the quality of the coke for the furnace trade and the manufacturer suffers accordingly.

The foregoing unsatisfactory experiences with the quench method of eliminating phenolic wastes have compelled industry to devote intensive study and research to this problem. American practice following the World War has developed means of refining further valuable constituents from the coal tar residues, including the

commercial extraction of phenol. The first attempt on a plant scale to be demonstrated in this country was the so-called benzol extraction process of phenol recovery installed by the Lorain, O., plant of the National Tube Works in 1924.[2] This by-product coke plant has a daily coking capacity of about 4,200 tons. Briefly, this type of recovery process comprises means for scrubbing with benzol the ammonia liquor from which the free ammonia has been distilled, but before the addition of lime for distilling off the fixed ammonia. The benzol absorbs or carries the phenol constituent of the liquor; subsequent separation of the phenol from the benzol carrier is accomplished by scrubbing the benzol with caustic soda, which converts the phenol to sodium phenolate, permitting gravity separation from the benzol. The benzol thus freed from the phenol is returned for additional carrier duty and the sodium phenolate neutralized with acid to free the phenol, or otherwise refined.

Following the experiences of the Lorain plant, similar works were installed at Buffalo and Troy, N. Y., in 1925 and 1926 respectively; and at Fairmont, W. Va., in 1927. Certain refinements in mechanical detail were perfected and different capacities in the absorbers and scrubbers employed; otherwise the Lorain experience was followed. As a result of the refinements, the percentage of phenol recovery was increased from 70 to 75 per cent, attained originally at Lorain, to 95 to 98 per cent at Fairmont. An estimate of the expense of installation and operation for the Fairmont plant was given to the Third Annual West Virginia Conference on Water Purification (1927) by Hugh E. Jones, chemical engineer of the Domestic Coke Corporation.[4] The daily coking capacity of the Fairmont Works is about 1,000 tons. The initial cost of the phenol recovery plant was about $25,000, and the cost of maintenance and operation is said to about equal the sale value of the phenol recovered. The success of the Fairmont plant is attested by the experience of the Morgantown, W. Va., water works, 20 miles downstream on the Monongahela River, as reported by Prof. W. W. Hodge of West Virginia University;[4] namely, the public water supply no longer contains objectionable phenolic tastes and odors.

Three other types of phenol recovery plants have been installed in the Ohio River valley. In April, 1928, the Midland, Pa., plant of the Pittsburgh Crucible Steel Company, with a coking capacity of 1,800 tons daily, placed in operation the Heffner-Tiddy process. In this method a preliminary scrubbing with benzol of the ammonia liquors containing the phenol is proposed to recover perhaps 60 per cent of the phenol, as already described for the Lorain and Fairmont plants. However, this preliminary treatment with benzol and subsequent recovery of phenol as sodium phenolate has not as yet been provided at the Midland plant. The ammonia liquor simply passes to a specially constructed ammonia still wherein the ammonia concentrations, and temperatures between 98° and 103° C., are controlled so as to cause the phenol to go over as ammonium phenolate. What becomes of the ammonium phenolate has not yet been definitely established. It may pass on through with the gas and be consumed; it may escape to the atmosphere in the cooling of the final cooler water; it may remain behind in the saturator; or it may contaminate the light oils. Data on the cost of installation and operation have not yet come to the attention of the writer. Also it is perhaps too soon to state what success has attended this installation. The patent owners expect to obtain from 95 to 98 per cent removal efficiency.

In May, 1928, the Ironton, O., plant of the Ironton By-product Coke Company, with a daily coking capacity of 1,300 tons, put into service a phenol recovery proc-

ess somewhat similar to the benzol type already described, except that light oil is used for the carrier instead of benzol. Since the Ironton plant does not manufacture benzol, the "light oil" type seems particularly adapted. Because the Ironton plant is also a liquid ammonia type of by-product coke plant, handling several times the volume of phenol bearing liquid handled by the sulphate type, the capacities of the scrubbers and absorbers are correspondingly larger; and furthermore because light oil is used in place of benzol these capacities have been specially worked out and may differ somewhat from those where benzol would be used. The phenol recovery plant at Ironton cost about $65,000 to install. Operation costs have not yet been released. Results for the first two months of operation have shown 90 to 95 per cent efficiency of phenol recovery; and expectations are for 95 to 97 per cent efficiency.

In September, 1928, the Hamilton, O., plant of the Hamilton Coke & Iron Works, coking capacity 1,200 tons daily, installed a phenol recovery process of the Koppers type. This process will probably be described more fully in another paper. Briefly, the process involves ordinary ammonia stills with careful heat control between 98° and 102° C. The liquor, from which the free ammonia has been driven, is pumped to the top of a scrubber through which steam and gas in large volume are passed. The phenol is volatilized and thus separated in a gaseous state from the liquor, which proceeds to the fixed ammonia still. The volatilized phenol is then absorbed in caustic soda scrubbers. The cost of this particular installation is understood to be in the vicinity of $40,000. Efficiency of phenol removal is claimed for this process of 95 to 98 per cent. Residues from the process will be evaporated upon the hot slag dump having an interior sump with no outlet to the river.

REACTION OF THE PUBLIC TO THE PROBLEM

It is not a difficult matter to determine what the public's attitude is toward a situation of this kind. Past experiences have been too numerous to recite where the public water supplies have been injured with phenolic tastes and odors. In a survey of such conditions in the Ohio River valley, H. R. Crohurst, of the U. S. Public Health Service, found in 1924[8] that 25 public water supplies were already badly affected and at least 25 more were likely to be, as a result of the operation of some 19 by-product plants within the area. Outside of the Ohio River valley important disturbances at various times have occurred at Cleveland, Buffalo, Milwaukee and Chicago in the Great Lakes area; and at Rochester, Troy and other places in New York.

Summing up the situation from a popular standpoint, there appears to be an immediate demand for complete relief. This demand usually is insistent and compelling, and more than likely may result in hasty and ill-advised actions. Most certainly, if the disturbances are frequently recurring, and if steps are not taken to alleviate the conditions, the public demands result in drastic action either embarrassing to industry, to public officials, or to both. As far as the public is concerned the end result is what counts and must be obtained; namely, a water that is not rendered unpalatable for drinking nor offensive for culinary and other domestic purposes.

The public ire is first directed toward the local water works officials, who are blamed for "doping" the water unnecessarily with the chemicals used in ordinary water purification practice. Frequently hasty removal of water works officials results, or attempts are made in this direction. Eventually the public learns that

these officials are not to blame and ire is next directed toward administrative officers having jurisdiction over the supervision and protection of public water supplies; thus local health officials and state health department officers are drawn in. The usual cry is for the industry causing the trouble to be forced to stop all operations forthwith; if legal powers are not deemed sufficient, make them so; or obtain injunctions to restrain the industrial operations causing the objectionable contamination. Failure to act thus and immediately seems to inspire in the average mind a contempt for the local or state official. Too often the public cannot understand why the problem cannot easily be solved, and solved permanently, by such simple expedients as passing new laws or local ordinances or asking the federal government to enact and enforce prohibitory legislation.

It takes courage on the part of administrative officials to embark upon any sensible plan of coöperation with industry in the study and formulation of a logical means of eliminating the stream pollution evil and at the same time be fair to all parties concerned. Much energy must be spent in educating the public and explaining the wisdom of concerted and coöperative action with industry. Recently the Ohio and Kentucky Health Departments have experienced particularly trying situations at Cincinnati and Louisville respectively. Federal legislation proposed by Cincinnati representatives was [illegible]ly contested by the health authorities as not being the adequate or sensible way of eliminating the phenol, or any other pollution problem, especially in view of results being attained by other means.

ATTITUDE OF ADMINISTRATIVE OFFICERS CHARGED WITH WATER SUPPLY SUPERVISION AND PROTECTION

The present coöperative attitude of the health department officials of the states in the Ohio River basin is the result of a progressive development beginning in 1923. The earlier experiences of Pennsylvania Health Department officials in dealing with the situation at the Cambria plant of the Bethlehem Steel Company at Johnstown, Pa., and later at the Clairton plant of the Carnegie Steel Company were studied by the Ohio Health Department officials and found to be productive of the desired results without recourse to legal proceedings or other possible antagonistic methods. It was decided to try out the coöperative method with industry in the case of the Cleveland disturbances of late 1922 and early 1923. At about the same time the Surgeon General of the U. S. Public Health Service was asked to call into conference the officers of all states in which the phenolic wastes problem existed, in order to learn the extent of the problem and to consider ways and means to care for the same. Such a conference was held at Washington, D. C., May 18, 1923, and again January 29, 1924.

In the meanwhile the Ohio Health Department officials were putting into practice in the Cleveland district the idea of coöperation with industry. The late Judge E. H. Gary, chairman of the Board of Directors of the U. S. Steel Corporation, assured Dr. John E. Monger, Director of Health of Ohio, that he might expect 100 per cent coöperation and prompt application of remedial actions not only in the Cleveland district but at any other locality where the U. S. Steel or subsidiaries were operating.

Based upon such a splendid response from industry and as a result of previous conferences with the U. S. Surgeon General, an interstate conference was called at Pittsburgh, Pa., on April 14, 1924, attended by health department officials and all of the by-product coke plant officials located in the Ohio River basin. The importance of the problem was thoroughly discussed; also practical ways and means for

eliminating the objectionable wastes. The industrial officials agreed that immediate action on their part was required and pledged complete coöperation to rid the Ohio River and its tributaries of phenolic wastes as promptly as possible. The health department officials in turn pledged their coöperation through uniform policies and reasonable requirements.

Pursuant to these earlier conferences and understandings the State Health Commissioners of Ohio, Pennsylvania and West Virginia met at Pittsburgh, Pa., November 17, 1924, and entered into formal agreement for a uniform policy of conservation affecting the interstate streams of the three states named.

OHIO RIVER INTERSTATE STREAM CONSERVATION AGREEMENT

By the terms of this original compact it was agreed—

> That the Departments of Health of Pennsylvania, Ohio, and West Virginia, represented respectively by the Secretary of Health of the Department of Health of Pennsylvania, the Director of Health of Ohio, and the Health Commissioner of West Virginia, hereby agree to coöperate in carrying out a policy for the conservation of the interstate streams in these states, including the correction and prevention of the undue pollution thereof, to the end that the said streams may be rendered and maintained as suitable sources of public water supplies as aforesaid.

By way of a supplement Kentucky was made a party to the agreement at a conference held in Pittsburgh, February 18, 1926. Also by supplement the states of New York, Maryland, Illinois, Indiana, and Tennessee were made parties to the agreement at a conference held in Pittsburgh, September 27, 1926, and in 1928 by supplement the states of North Carolina and Virginia were also made parties to the agreement.

Although the agreement had its inception on account of the phenolic wastes problems its terms were purposely made much broader. A gradual expansion of the workings of the agreement led to the adoption of a resolution on the part of the several health commissioners, signators to the Ohio River Interstate Stream Conservation Agreement, at a conference in Cincinnati, October 18, 1927. This resolution constitutes an important explanation of the working of the agreement and is therefore quoted:

> WHEREAS it is necessary to adopt certain [illegible]ies and procedures in order effectively and efficiently to carry out the letter and the spirit of coöperation and conscience upon which the Ohio River Interstate Stream Conservation Agreement is founded, therefore be it
>
> RESOLVED that the following policies and procedures be adopted as part of the said agreement.
>
> 1. The Chief Engineers of the Departments of Health, signators to the Ohio River Interstate Stream Conservation Agreement, shall constitute the "Board of Public Health Engineers of Ohio River Basin" hereinafter referred to as the Board.
>
> 2. The Board shall meet at least annually during the first week of December and shall recommend, from time to time as may be deemed necessary, to the Health Commissioners, signators to the Agreement, ways and means for effectively and efficiently carrying out the letter and the spirit of the Agreement.
>
> 3. As adequate protection of public water supplies from damage caused by phenol and other tarry acids discharged into the source of such supplies requires substantially complete and continuous elimination of the discharge of wastes containing such constituents, or substantially complete and continuous removal of such constituents prior to discharge; therefore the signators of the Agreement should promptly institute action to require such elimination or removal by suitable treatment prior to discharge.
>
> 4. The signators to the Agreement will notify promptly downstream or adjacent signators of unusual events affecting the Ohio River or its tributaries, such as phenol

TABLE I

OPERATION OF BY-PRODUCT COKE PLANTS AND PHENOL TREATMENT WORKS IN OHIO
1914–1928

Name of Company	Location	Date By-Product Plant Started Operation	Coal Coking Cap. Tons Per 24 Hours	Receiving Stream	Partial Phenol Waste Elimination System Placed in Service		Complete Phenol Waste Elimination System Placed in Service		Method Now Used
					Date	Per cent Removal	Date	Per cent Removal	
Trumbull Cliffs Furnace Co.	Warren	July 7, 1924	1,275	Mahoning	July 7, 1924	90	Aug., 1926	98	Coke Quenching and Ponding
The Youngstown Sheet & Tube Co.	Youngstown	May, 1917	1,400	"	——	—	Aug., 7, 1926	100	Coke Quenching
Republic Iron & Steel Co.	"	Apr. 20, 1914	4,000	"	Aug. 15, 1925	20	Jan. 26, 1926	100	" "
The Youngstown Sheet & Tube Co.	"	Aug., 1916	5,000	"	——	—	Oct. 8, 1926	100	" "
Central Alloy Steel Corp.	Canton	Oct. 1, 1916	865	Nimishillen	June, 1923	80	June, 1926	100	" "
Central Alloy Steel Corp.	Massillon	Apr. 21, 1927	1,070	Tuscarawas	——	—	Apr. 21, 1927	100	" "
The Ironton By-Product Coke Co.	Ironton	July, 1918 *	1,350	Ohio	March, 1926	30	May 28, 1928	95	Phenol Recovery
The Portsmouth By-Product Coke Co.	Portsmouth	Jan., 1918 †	2,200	"	——	—	Aug. 1, 1926	95	Coke Quenching
Hamilton Coke & Iron Co.	Hamilton	Apr. 20, 1928 ‡	1,220	Miami	Apr. 20, 1928	80			Ponding

* By-product coke plant out of operation from Dec., 1920, to Oct., 1922
† Phenol recovery equipment being installed; coke plant shut down from Jan., 1921, to Dec., 1921; operation treatment works suspended from Nov. 1, 1927 to June 1, 1928
‡ Phenol recovery works under construction; to be completed about Sept. 29, 1928

TABLE II

OPERATION OF BY-PRODUCT COKE PLANTS AND PHENOL TREATMENT WORKS IN KENTUCKY
1913–1928

Name of Company	Location	Date By-Product Plant Started Operation	Coal Coking Cap. Tons Per 24 Hours	Receiving Stream	Partial Phenol Waste Elimination System Placed in Service		Complete Phenol Waste Elimination System Placed in Service		Method Now Used
					Date	Per cent Removal	Date	Per cent Removal	
The Ashland By-Product Coke Co.	Ashland	Aug., 1913	1,800	Ohio	—	—	Oct. 31, 1928 *	95	Phenol Recovery

* Phenol recovery works under construction; to be completed about Oct. 31, 1928

The Ashland By-Product Coke Co.	Ashland	Aug., 1913	1,800	Ohio	—	—	—	—	—

* Phenol recovery works under construction; to be completed about Oct. 31, 1928

TABLE III

OPERATION OF BY-PRODUCT COKE PLANTS AND PHENOL TREATMENT WORKS IN WEST VIRGINIA
1914–1928

Name of Company	Location	Date By-Product Plant Started Operation	Coal Coking Cap. Tons Per 24 Hours	Receiving Stream	Partial Phenol Waste Elimination System Placed in Service		Complete Phenol Waste Elimination System Placed in Service		Method Now Used
					Date	Per cent Removal	Date	Per cent Removal	
Domestic Coke Corp.	Fairmont	Dec., 1920	1,000	Monongahela	1926 *	—	Jan., 1927	96	Phenol Recovery
Weirton Steel Co.	Weirton	July, 1923	2,300	Ohio	Nov., 1926 †	100	——	—	Coke Quenching
Wheeling Steel Corp.	Follansbee	Feb., 1917	2,600	Ohio	——	—	——	—	No treatment
Semet Solvay Company ‡ (National Tube Co. Plant)	Benwood	——	800	Ohio	——	—	——	—	No treatment

* Lagooning and quenching with wastes attempted, later discontinued
† Coke quenching operations began in 1926, were discontinued during 1927
‡ Plant shut down since Dec., 1926

TABLE IV

OPERATION OF BY-PRODUCT COKE PLANTS AND PHENOL TREATMENT WORKS IN PENNSYLVANIA

Name of Company	Location	Date By-Product Plant Started Operation	Coal Coking Cap. Tons Per 24 Hours	Receiving Stream	Partial Phenol Waste Elimination System Placed in Service		Complete Phenol Waste Elimination System Placed in Service		Method Now Used
					Date	Per cent Removal	Date	Per cent Removal	
Bethlehem Steel Co. (Franklin Plant)	Johnstown	1895	3,500	Conemaugh	—	—	1916	100	Coke Quenching
Bethlehem Steel Co. (Rosedale Plant)	Johnstown	1919	3,500	"	—	—	1919	100	" "
Carnegie Steel Co.	Clairton	June, 1918 *	30,000 *	Monongahela	—	—	June, 1918	100	" "
Jones & Laughlin Steel Corporation (Hazlewood Plant)	Pittsburgh	June, 1919	6,500	Monongahela	—	—	June, 1919	100	" "
Jones & Laughlin Steel Corporation (Woodlawn Plant)	Pittsburgh	1926	3,000	Ohio	—	—	1926	100	" "
Carnegie Steel Co.†	Farrel	1912 ‡	——	Shenango	—	—	1913 † ‡	100	" "
Pittsburgh Crucible Steel Co.	Midland	1922 ‡	1,800	Ohio	—	—	Apr., 1928	95	Phenol Recovery

* Original capacity 10,000 tons daily; additions to by-product coke oven capacity were made in Jan., 1919, June, 1924, and Oct., 1927
† The by-product coke plant at Farrel was dismantled in 1925 ‡ and is no longer operating
‡ Date not verified and is approximate only

spills, typhoid fever epidemics, etc., in order that suitable measures may be taken by such downstream or adjacent signators to the Agreement as are needful to protect the public health.

5. The signators to the Agreement, in matters relevant thereto, will coördinate present and proposed research, exchange data derived therefrom, and exchange ideas on administrative policies for mutual benefit.

6. The signators to the Agreement will furnish to downstream or adjacent signators data concerning discharge of sewage or industrial wastes or the treatment thereof in cases where such matters might prejudicially affect such signators in order to obtain thereby the views and judgment of such downstream or adjacent signators.

7. Any signator to the Agreement invoking the provisions thereof for abatement of alleged harmful pollution shall first establish the fact that the cause of the alleged harmful pollution does not exist within its own jurisdiction but does exist within the jurisdiction of the upstream or adjacent state.

8. The signators to the Agreement in matters involving mutual concern will arrange for joint inspections of water works, alleged pollution of interstate streams, the alleged effects thereof, the stream involved therein, proposed remedies, and reports thereon whenever deemed necessary.

ACCOMPLISHMENTS UNDER THE OHIO RIVER INTERSTATE STREAM CONSERVATION AGREEMENT

As stated previously, elimination of phenolic wastes was the dominant factor in the creation of the Ohio River Agreement. It is pertinent therefore to call attention to accomplishments in this direction, although space will not permit me in this paper to recite in detail certain other accomplishments. Appended will be found a chronological tabulation of data relating to the establishment of by-product coke plants and phenolic wastes elimination devices for all such plants on the Ohio River watershed grouped by states. The chief engineer of the health department of each state is the authority for such data.

It will be noted that Pennsylvania first installed phenolic wastes elimination devices utilizing the quench system. Five plants are located in Pennsylvania in the Ohio River basin, 4 of which installed the quench system prior to the signing of the formal agreement in November, 1924. The fifth plant, that of the Pittsburgh Crucible Steel Company at Midland, installed the Heffner-Tiddy process of phenol recovery April 25, 1928. This action was pursuant to an order of the Sanitary Water Board of Pennsylvania as part of the execution of the Interstate Agreement. The plant is located almost at the Pennsylvania-Ohio state line and affects no Pennsylvania water supply interests. Thus it will be seen that as far as the Ohio River basin is concerned Pennsylvania is taking care of phenolic wastes 100 per cent.

In Ohio none of the 9 by-product coke plants in Ohio River basin had provided for treatment or proper disposal of phenolic wastes prior to 1924; today all have complied with the requirements. Seven are quenching and 2 are recovering phenol. Phenol recovery by the " light oil " method is being practiced by the Ironton By-product Coke Company, Ironton, and by the " Koppers " method at the Hamilton plant of the Hamilton Coke & Iron Works. One or two of those plants now maintaining quench systems are experimenting and studying phenol recovery processes with a view to installing the same at an early date. Thus it will be noted that Ohio has reached 100 per cent in installing phenolic wastes treatment and disposal plants in the Ohio River basin.

Kentucky has but 1 by-product coke plant, located on the Ohio River at Ashland. Pursuant to the terms of the Agreement this company was ordered by the

Kentucky State Board of Health to provide proper disposal of the phenolic wastes, and in compliance therewith has practically completed a phenol recovery works of the " light oil " method. The date for beginning operation is October 31, 1928.

West Virginia has 4 by-product coke plants in the Ohio River basin. One discontinued operation late in 1926. One installed the quench system in order to comply with notifications of the State Health Department; although recent advices are that this plant, of the Weirton Steel Company, has discontinued the quenching operations. Another, the Domestic Coke Corporation of Fairmont, installed, in January, 1927, the " benzol " method of phenol recovery. The remaining one, the Wheeling Steel Corporation at Follansbee, as yet has made no proper disposition of the wastes. It is fair to state, however, that following recent representations on the part of the West Virginia Health Department, the Wheeling Steel Corporation has agreed to install a suitable phenol recovery process, probably following either the " Koppers " or the " benzol " method.

Summing up the Ohio River basin situation, it will be noted that of the 18 plants having phenolic wastes for disposal only 2 have not complied with the requirements regarding the installation of phenol elimination devices.

In addition, the companies operating the phenolic wastes elimination devices who have thus far been approached upon the subject have agreed to report regularly to the several health departments concerning the operation of the plants. In particular, data will be furnished on efficiencies of phenol recovery, tests for phenol in the receiving streams, and prompt information about accidental phenol spills.

NEED FOR SIMILAR REMEDIAL MEASURES ELSEWHERE

Outside of the Ohio River basin there exists need for similar remedial measures. In Ohio there are 6 by-product coke plants on Lake Erie drainage area, 5 of which are operating satisfactory quench or recovery devices; the one at Toledo apparently does not now deleteriously affect any water supply interests, but is investigating a possible recovery installation or other means for the treatment of its phenolic wastes.

New York and Pennsylvania have by-product coke plants, not on the Ohio River watershed, some of which have given concern. Relief measures have been instituted or are under way in most of these cases.

In the southern Lake Michigan district the need for relief has been felt keenly during the past year. Following the precedent of the Ohio River Interstate Stream Conservation Agreement a similar one has recently been effected known as the Great Lakes Drainage Basin Sanitation Agreement.

SUMMARY AND CONCLUSIONS

The results obtained in phenolic wastes disposal under the Ohio River Basin Interstate Stream Conservation Agreement have demonstrated the usefulness and wisdom of this plan. Uniformity in policies, close coöperation of personnel, exchange of information and data, joint actions where the occasion warrants, all make for an effective instrument. Although state laws in many instances grant full authority within their own borders, nevertheless the above mentioned agreement sets forth mainly a program of coöperation between states and with the industrial interests of these states, without detracting from legal means for compelling action that may be warranted in certain cases.

Industry appreciates and demands utmost frankness and fair dealing. It understands that the public interests are paramount and knows that it cannot

affront public opinion, or ignore its righteous demands for relief such as result from offensive pollution of public water supplies.

In setting forth to the by-product coke industry the requirements of the situation in the Ohio River valley, the states, through their health department officials, have tried to be reasonable both as to results to be obtained and in the time allowed for perfecting individual arrangements. As far as phenolic wastes are concerned the criterion of removal has been declared to be substantially complete; that is, the wastes must be modified so as not to render public water supplies objectionable for full domestic uses.

Justice to the industry as a whole also demands fairness in dealing with a few corporations which may be loath to incur the expense of, or hesitate to undertake the task of eliminating the phenolic and other objectionable waste products of industrial operations discharged into our rivers and streams.

The results in the Ohio River basin, which have been obtained by agreement and coöperation, bespeak the merit of the plan. These results have been obtained much better and more quickly than if the matter had been left, as some of our constituents would have had us do, to the enactment of federal laws and the operations of a federal enforcement agency.

We have been criticised for drawing up an instrument without legal force. Our answer is that there are enough laws already. What is needed is a "conscience" between ourselves as state agencies and between us and the industrial corporations involved. This, then, is just what we have endeavored to put into practice.

REFERENCES

1. Watt, D. M. Phenol Waste Pollution. Address delivered at the Thirtieth Annual Meeting of the Pennsylvania Water Works Assn., Atlantic City, N. J., Oct. 21, 1925.
2. Marquard, Frank F. The By-product Coke Plant at Clairton, Pa. Read at the Fifteenth General Meeting of the American Iron and Steel Inst., New York, N. Y., May 23, 1919.
3. Doty, L. E. Statement to the Ohio Department of Health, Sept. 15, 1928.
4. Jones, Hugh E. Elimination and Recovery of Phenols from By-product Coke Oven Wastes as Done at Fairmont, W. Va. *Proc. Third An. Conf. Water Purification, W. Va. Univ. Coll. Eng. Bull.*, Nov., 1927.
5. *Proc. Phenol Waste Conference*, Pittsburgh, Pa., Apr. 14, 1924.

NOTE: For discussions of this paper by William L. Stevenson, C. A. Holmquist and Ellis S. Tisdale, see the Public Health Engineering notes on page 817.

Some Aspects of Intestinal Bacteriology in Relation to Health*

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THE human intestine, particularly the colon, is a veritable culture tube. It is in a sense extra-corporeal, and, therefore, suffers constant invasion of an almost endless variety of microscopic organisms, bacteria, moulds and yeasts being ordinarily the most common. Yet, the environmental conditions of the intestine are such that only certain restricted groups or types are able to adapt themselves and carry on a continued existence.

It is still a moot question as to what the various influences are which operate to control the development and activities of the so-called intestinal organisms. It seems to be an established fact, however, that food and the chemical nature of the intestinal detritus play a very important part.

The contents of the intestine of the normal new-born infant are sterile. Very soon after birth microörganisms make their entrance, particularly through the mouth. According to Moro, Tissier and others there is established, in the course of relatively few hours, a heterogenous flora which is in no sense characteristic, and which is succeeded soon by one that assumes a more or less definite relationship, depending upon the nourishment of the child. When the infant is put on mother's milk the intestinal contents soon acquire the biological characteristics associated with breast feeding, the flora assuming a more or less definite picture in which Gram-positive organisms of the bifidus, acidophilus and enterococcus types play a very prominent rôle.

It was long a matter of debate between Tissier and Moro as to which of the two organisms, *B. bifidus* and *B. acidophilus*, is the more prominent. Our own researches have shown that both are present in the intestine during high lactose or dextrine feeding.[1] For example, it was repeatedly demonstrated that the administration of from 3 to 4 gm. of lactose daily to white rats results in the proliferation of the bifidus type to the almost complete exclusion of all other forms, in-

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cluding *B. acidophilus*. On reducing the amounts of lactose fed daily from 2 to 3 gm., the bifidus type gives way to *B. acidophilus*, which can be maintained at a high percentage level by continued lactose feeding. Analogous results were obtained in human subjects.

With the gradual substitution of other foods in place of milk (lactose) there is a corresponding change in the flora, in which organisms of the bifidus and acidophilus types become relatively fewer and may be almost completely displaced by other forms, namely, those which characterize the flora of the ordinary adult living on a mixed diet which includes very little or no milk or lactose. Among these non-aciduric forms *B. coli* and *B. welchii* have a conspicuous rôle.

That the character of the intestinal flora can be altered almost at will by the regulation of the diet has been shown by us in our extensive experiments on rats and on human subjects, and by various other investigators. Lactose or dextrine, when administered in sufficient amounts, encourages the rapid development of the aciduric types of organisms in the intestine, particularly *B. acidophilus*. Other carbohydrates seem to lack this property, or possess it in only a limited degree.

For some individuals, as small amounts as from 5 to 10 gm. of lactose will suffice. Others will require 100 gm. or more daily, and occasionally a subject may not respond to less than from 350 to 400 gm. of the sugar. The range of susceptibility is indeed very wide.

Lactose is not inverted rapidly in the intestine, and thus a goodly portion of the amount taken reaches the colon where it serves as a favorable medium for the development of *B. acidophilus*. We have held, largely, on the strength of our own observations, that the stimulating effect of lactose is due to the highly favorable environment which it furnishes in the intestine for the development of *B. acidophilus*. More recently Cannon and McNease[2] claim to have shown that the change in flora is due to increased acidity alone. While increased acidity, in certain cases where the amount of lactose feeding has been at least reasonably large (as in Cannon's experiments with rats), may play a decided rôle, we still have reason to believe, from Kopeloff's[3] and our own work, that this is not the sole cause.

B. acidophilus, a characteristic organism of milk-fed infants, can be implanted in the human intestine, and by the use of proper diet made to develop and displace in a large measure the types which are so prominent in persons subsisting on the usual mixed diet, particularly *B. coli* and *B. welchii*.

Years of observations have convinced us that the most effective system of establishing the aciduric type is one in which an appropriate

strain of *B. acidophilus* is administered in large numbers along with appreciable amounts of lactose. These two important agents are combined best in a well ripened milk culture of *B. acidophilus*, now generally known throughout the country as acidophilus milk.

No one can deny certain limitations which acidophilus milk possesses for persons who have a dislike for acidified milk, or milk in any form, and particularly for those who (though rare) have no tolerance for milk proteins. A study of the situation will reveal that the permanent objectors to acidophilus milk are after all relatively few; many of those who have an initial dislike for the product can and do cultivate a taste for it. An acidophilus concentrate which combines the salient features of acidophilus milk would be a welcome substitute. From our own repeated experience with attempts to furnish such a substitute product, we are convinced that the task is extremely difficult, if not insurmountable, despite the almost innumerable efforts made in this direction, owing to the peculiarly delicate nature of *B. acidophilus*, and the exacting requirements of a genuine product.

Acidophilus milk holds a unique position here. It possesses essentially the same food value as plain milk. As a sour milk it should take a prominent place in the rapidly growing practice of supplying acid milk both as a beverage and health drink. It combines in the most satisfactory way the two chief factors upon which a successful treatment depends, namely, massive quantities of viable *B. acidophilus*, and from 4 to 5 per cent lactose, which is so essential in the stimulation and development of this organism in the intestine.

Fortunately, the casein and lactalbumin serve as pronounced buffering agents against the relatively high acidity (hydrogen ion concentration) which is produced by the organism, and which without such buffer influence would rapidly tend to destroy the viability of *B. acidophilus* and thus defeat its chief purpose. The importance of this protective action cannot be overestimated.

An endless amount of harm has been done by so-called acidophilus milk which is impure and contains relatively few organisms of the desired type. Recently manufacturers have been made to realize that this product is a major specialty and that to produce it requires unusual facilities, including a bacteriological laboratory and a trained bacteriologist, and, above all, constant scientific supervision.

From time to time we hear of renewed efforts to produce acidophilus milk in the home. The latest attempt to convince the general public of the practicability of home production is that of Rice.[4] That he does not appreciate the difficulties involved, as any trained bacteriologist would, is revealed when he states that by observing a little

care acidophilus milk may be prepared in the home; and that it is now possible to obtain a pure culture as starter at or through all drug stores. His entire method of production and of purity control rests on unsound principles of asepsis and disinfection, and if followed will lead to untold injury and disappointment. That the problem of acidophilus milk production is essentially one for the bacteriologist, and not the chemist, is again clearly shown in this instance.

It would be presumptuous for me to take advantage of this occasion to extol the virtues of acidophilus therapy. Nor do I wish to enter at this time into the subject of when and how the acidophilus principle should be applied. Such information may be had by consulting publications from our laboratory and from various other sources. Let me state briefly, however, that experiences of the past three or four years lend further support to the principle, and that our confidence in its permanent establishment has not been shaken.

It is to be regretted that often so little intelligence is exercised in applying the acidophilus treatment. In many instances it has been set up as a cure-all, and the user has been led at the outset to believe that ailments which have taken years to develop will be alleviated by one or two days' administration of this biologic agent. There has been a notion also that all ailments will respond to it.

It should be borne in mind that this treatment is indicated only in cases of intestinal disturbances and ailments associated with them, particularly constipation and diarrhea, and their concomitant systemic effects, which are not the result of anatomical or structural derangement. In all instances large quantities of the living organisms must be administered.

Prolonged treatment is necessary in some instances, particularly in cases of chronic constipation. Furthermore, even where relief has become quite apparent, continued or intermittent use of the product is highly desirable over a reasonable period of time. No well authenticated evidence has yet been brought to our knowledge that acidophilus milk has done any harm as such. To persons suffering from diabetes or who do not tolerate milk in any form, it should, of course, not be administered. In all cases of doubt, the family physician is to be consulted.

Perhaps the greatest obstacle to the full realization of acidophilus therapy lies in the multitudinous products which are parading under the name of "acidophilus," but which resemble it only in name. The market has been flooded with preparations ranging in form from tablets, water and oil suspensions, broth and tomato broth cultures and chocolate coated candies, to whey and milk cultures.

Aside from a fairly limited number of commercial milk cultures or brands of so-called acidophilus milk, very few market preparations possess any merit whatsoever as acidophilus products. This has been shown recently by James[6] in his survey of commercial *B. acidophilus* and *B. bulgaricus* cultures and preparations, and by various other scientific observers.

In relatively few instances do so-called acidophilus products contain living bacilli which resemble in any way the organism the package purports to contain. Further than this, some well known preparations contain an organism which bears a general resemblance to *B. acidophilus* but is not identical with it, and according to our observations belongs to an entirely different, but related, group of bacteria. This type of bacillus is employed, we may presume, because it is peculiarly resistant to unfavorable conditions (acidity, drying, and storage) to which *B. acidophilus* is known to have much less resistance.

California has passed a regulation which confers authority upon legally constituted agents to determine and deal with those acidophilus products dispensed within the state which are not genuine. It is hoped that other states will do likewise, and that the federal authorities will soon undertake to control the purity and genuineness of all "acidophilus" preparations sold in interstate commerce, as we have reason to believe they may do.

Finally, there is another subject that bears closely on acidophilus therapy which has recently been brought to the front; namely, the alleged etiological relation between *B. acidophilus* and dental caries. In 1922, Rodriguez[8] and McIntosh, James and Lazarus[7] reported the presence of an organism in dental decay which exhibited some of the properties of *B. acidophilus;* this they named *B. acidophilus-odontolyticus.* More recently other investigators have encountered a similar type of organism in carious teeth, and because it was regarded by them as resembling the Moro bacillus, named it *B. acidophilus.*

Bunting and Palmell[9] unequivocally announced the organism to which they ascribed a definite and direct etiological relationship in dental caries as *B. acidophilus.* Since then Bunting and his associates have made similar statements. We believe that their classification was not based on sufficient scientific evidence, and that they, therefore, violated a very important principle of taxonomy. That the biological position of their organism was of relatively little concern to them, although they expressed such certainty as to its identity, cannot but impress itself on the minds of those who have followed their work and printed statements.

The extensive researches conducted in our laboratory by Mori-

shita,[9] on more than 100 different strains of acid-forming and aciduric organisms isolated from dental caries, together with some of Bunting's strains, have conclusively shown that the aciduric organisms commonly associated with abnormal, decaying teeth are not *B. acidophilus*, but rather distantly related types. Among other things, he states, in his preliminary publication, that "the occurrence of *B. acidophilus* of the intestinal type in dental caries is relatively rare compared with the other aciduric organisms found, and may be regarded as merely adventitious"; and, "the present comparative study seems to the writer to warrant the conclusion that the tooth organisms discussed (by him) constitute a type entirely separate from *B. acidophilus* of the intestinal tract."

Space does not permit me to go into the various points of difference upon which Dr. Morishita based his conclusions.

REFERENCES

1. Rettger, L. F., and Cheplin, H. A. *Treatise on the Transformation of the Intestinal Flora with Special Reference to the Implantation of Bacillus Acidophilus.* Yale University Press, 1921.
2. Cannon, P. R., and McNease, B. W. Factors Controlling Intestinal Bacteria, Influence of Hydrogen-ion Concentration on Bacterial Types. *J. Infect. Dis.*, 32: 175 (Mar.), 1923.
3. Kopeloff, N. *Lactobacillus Acidophilus.* Williams & Wilkins, 1926.
4. Rice, F. E. The Preparation of Acidophilus Milk. *A. J. P. H.*, 18: 1105 (Sept.), 1928.
5. James, L. H. Commercial Bacillus Acidophilus and Bacillus Bulgaricus Cultures and Preparations; Bacteriologic Status. *J. A. M. A.*, 89: 89 (July 9), 1927.
6. Rodriguez, F. E. *Mil. Dent. J.*, 5: 199, 1922.
7. McIntosh, J., James, W. W., and Lazarus-Barlow, P. Etiology of Dental Caries (second paper). *Brit. J. Exper. Path.*, 5: 175 (June), 1924.
8. Bunting, R. W., and Palmerlee, P. The Rôle of Bacillus Acidophilus in Dental Caries. *J. Am. Dent. Assn.*, 12: 381 (Apr.), 1925.
9. Morishita, T. Comparative Study of Certain Aciduric Organisms of Intestinal and Dental Origin. *Proc. Soc. Exper. Biol. & Med.*, 25: 654, 1928.

Cuba's First National Congress of the Child

THE first National Congress of the Child in Cuba was held in Habana in December, 1928, under the auspices of the government.

The resolutions enacted called for, among other things, the establishment of juvenile courts, courses in dietetics for teachers of primary schools, legislation for prenuptial certificates of health, the appointment of a committee of experts for the study of infant and child feeding, medical supervision over school children, and a number of other child welfare measures.

The congress has also adopted a statement of principles on the rights of the child, called the Declaration of Habana. This is somewhat similar to the Declaration of Geneva on the same subject.

Evaporated Milk and Its Relation to Public Health*

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THE use of concentrated and preserved milks has grown tremendously in the past 20 years. In 1908 the amount of milk evaporated, condensed and dried, and consumed in the United States was less than a billion pounds. Now 4⅓ billion pounds per annum is used.

Evaporated milk is prepared by removing a little over half the water, sealing in cans, and sterilizing. It has a creamy consistence and differs from ordinary milk in containing slightly more than twice the amount of solids. The United States Government sets a minimum standard of 7.8 per cent fat and 25.5 per cent total milk solids.

Condensed milk, sometimes called "sweetened condensed milk," is concentrated to about the same degree as evaporated milk, and sufficient sugar added to preserve it.

Dry milk is a powder, and contains not more than 1 or 2 per cent of moisture. It contains no added substance, but often a part or all of the cream is removed. If skimmed, or part skimmed, the label so states.

Evaporated milk, in this country, is not skimmed. Sweetened condensed skimmed milk in cans has appeared from time to time, but most of that now sold in the United States is whole milk, though sweetened condensed skimmed milk in barrels is a common commodity, used in candy and ice cream making.

There are two other forms of concentrated milk of less importance to us here—one sold in bulk, not sterilized, which goes mostly to ice cream manufacturers, and *malted milk,* which contains predominantly products resulting from the malting of grain, only about a third of the total being milk solids.

EVAPORATED MILK

On the basis of milk solids, more unsweetened evaporated milk is consumed in the United States than condensed and dry together

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—nearly twice as much. As many pounds are used as ice cream, twice as many as candy. The industry takes the production of 600,000 cows. Thirty-eight thousand freight cars were required to carry last year's pack.

This would seem to be a commodity that deserves attention from the public health point of view. First, as a milk supply, is it pure, clean and wholesome? Second, is it a nutritious, economical and practical food, one that can be recommended for greater use as a means of promoting the health of a family, a community, and a nation?

Evaporated milk plants are located near the source of supply. In a few hours after the raw milk is produced it has been hauled to the plant and transformed into evaporated milk. It usually takes longer to transport raw milk to the large city and deliver it. For this reason it has been said that evaporated milk reaches the consumer in fresher condition. If " freshness " in foods means that they have not undergone changes brought about by bacteria or enzymes, then canned foods in general can be considered to be the freshest.

Water is removed by heating *in vacuo,* and the concentrated milk is homogenized by forcing it under high pressure through a minute aperture. This reduces the fat globules to a small fraction of their original size. In fact colloidal proportions are attained, since the particles remain distributed throughout the milk, uninfluenced by gravity. Cream does not separate in evaporated milk.

The cans are filled, sealed and sterilized under a steam pressure of about 11 pounds.

SAFETY

Good evaporated milk cannot be prepared from dirty or sour milk. Every packer exercises supervision over the dairies which produce the milk, and its quality is observed when brought to the plant. The farmer must employ sanitary methods, and keep the milk cold until delivered.

The milk within the plant passes rapidly from one stage to the next through an arterial system of sanitary piping, " not touched by human hands."

Sterilization in the can frees the milk of any organisms that could impair its quality or endanger health. As far as the transmission of disease is concerned, evaporated milk gives even more protection than certified milk because the hazard of human error is eliminated.

The answer to the first question is in the affirmative—evaporated milk is safe and dependable.

The transportation of food from the place of production to the

place of consumption, and its storage from the season of plenty to the season of scarcity, are problems of major importance. Economy and safety, chiefly, are involved in the former and the prevention of waste in the latter.

Some maintain that the milk supply of the future will be preserved in cans. This will probably never be wholly true, but it will be a more important factor than at present. The milk shed of the city is constantly widening. There must be a limit, a distance beyond which it is neither economical nor safe to ship raw milk to the consumer. The cost of shipping 7 parts of water with 1 part of food, and of handling such an extremely perishable food, cannot but take its toll in limited consumption.

There are plenty of data to prove that the evaporated milk industry is fulfilling the requirements of an economical milk supply. Evaporated milk produced within 100 miles of Chicago is being delivered in that city for 20 per cent less than the milk delivered in bottles. Indeed, Wisconsin milk is delivered in Florida for much less than the cost of market milk in that state. By 43 years of scientific effort, the industry has learned how to evaporate milk efficiently and economically; refrigeration of the product in transit is not necessary; there is less water to transport; no bottles to break; no high wages to pay to union milk wagon drivers.

Evaporated milk production acts as a stabilizer of the whole dairy industry. It continues throughout the year, but the peak comes at the height of the milk flow. At this time, when there is a raw milk surplus, waste would occur, and it is likely that the farmer would receive a ruinous price were it not possible to transform the surplus into such less perishable products as evaporated milk, butter and cheese.

HOME ECONOMICS

If we agree that it would be for the betterment of the public health to increase milk consumption, it would seem to be wise, as one part of our educational program, to find new ways of putting milk into the diet, rather than to expend all our efforts in urging the drinking of more milk. There is a limit to the amount of milk people will drink; a quart per person per day probably can never be reached.

Many cooked foods require milk, and many could be made more appetizing as well as more nourishing by the inclusion of milk. Evaporated milk is particularly well adapted for this.

Nutritional workers have long maintained that ice cream would be a better food if it contained more of all the solids of whole milk and less fat than the government requires. Ice cream is consumed

more largely in summer and in warm climates where foods of high caloric value are undesirable. It is frequently taken as a dessert after an entirely adequate meal. A low fat ice cream with fine texture can be made from evaporated milk. Due to the physical character of the fat and protein only small ice crystals are permitted to form in freezing. Ice cream and candy manufacturers have long recognized the influence of evaporated milk on texture.

For artificial feeding of infants it is necessary to have milk that is safe, digestible, uniform, and nutritious. Evaporated milk fulfils these qualifications. The curd is soft, resembling that of human milk, because of the physical changes in the casein due to homogenizing and sterilizing.

NUTRITIVE VALUE

The statement has often been made that when milk is heated there is some loss of mineral. A slight precipitation on the sides of the container has been noted where large quantities of milk are heated. From the point of view of colloid chemistry, there is some evidence of a rearrangement of mineral combinations in milk when heated. There is no evidence that the new combination of calcium, phosphorus and other elements is not just as soluble in the gastric juice and just as assimilable as the original combination. It has been demonstrated that the calcium and phosphorus of evaporated milk are fully assimilable.

With the exception of C, the vitamins are present in apparently the same amounts as in raw milk. Not only does the casein of evaporated milk form a more fluid curd, but it is more readily hydrolyzed by the digestive enzymes, and assimilated.

The fat is more highly emulsified in consequence of the homogenization. Since emulsification is the first step in fat digestion, evaporated milk should prove particularly acceptable to infants or those with deranged digestive functions.

There is evidence that an individual who reacts anaphylactically to raw milk may take foods containing evaporated milk with impunity. The heat of sterilization apparently renders the sensitizing constituents of the milk inactive.

A dietetic experiment of magnitude proving the value of the concentrated milks in public health was the work of the American Relief Administration in Europe during the World War. Herbert Hoover in an address before the World's Dairy Congress made the following statement:

> It is perhaps interesting to note that this organization and its allied organizations exported from the United States, for the use of those children, upwards of

500 millions of pounds of condensed (evaporated and condensed) milk during the period of the war and reconstruction. It could be very well said that the saving of millions of children was accomplished only by virtue of the strength, the resilience, of the American Dairy Industry.

SUMMARY AND CONCLUSIONS

The marked increase in the use of the concentrated milks indicates their importance from the public health point of view. One and one-quarter billion pounds per year of unsweetened evaporated milk is consumed in our country.

Canned foods of all kinds have received a clean bill of health. The methods of production are above reproach, and any loss in nutritive value in canning is negligible.

The preparation of evaporated milk from good, clean milk near the source of production, and the promptness with which it is evaporated, are among the factors that make it the safest supply. From the economic point of view, evaporated milk is the most efficient, and this industry assists in stabilizing the whole dairy industry.

The average consumption of whole milk cannot be brought to the optimum by alone urging the drinking of milk. The use of milk in prepared foods can be made a more important factor than it is now. Evaporated milk is the logical whole milk supply. Its concentration, smoothness and flavor admirably adapt it to this purpose. Its convenience makes for increased usage.

Infants require a safe, digestible, uniform and nutritious milk—qualities found in evaporated milk.

There is no important loss in nutritive value when raw milk is evaporated. The protein and fat are made more digestible.

The public health value of evaporated, and other concentrated milks, was fully demonstrated during the World War.

Evaporated milk is no longer to be recommended only when raw milk is not to be had. It has a definite place in the nutritional economy of the family and the nation.

NOTE: The references presented with this paper may be obtained by corresponding with Dr. Rice.

DISCUSSION

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FROM the theoretical standpoint, evaporated milk would appear to possess distinct advantages for infant feeding. Chief among these are absolute sterility, easy digestibility on account of the heat alteration of protein, constant and known composition, and availability, and the ease with which feeding formulas

may be prepared. It is difficult to see why it has not had a more extensive use for this purpose. The prejudice against canned foods, and confusion with sweetened, condensed milk, seem to have been the important factors in limiting its use. It has been recommended by some pediatricians for use in the treatment of infants with special conditions, but has not been generally advocated as a routine food for normal infants. Fresh milk has apparently been considered superior, but no good reasons for this have been brought forward.

Evaporated milk possesses so many advantages that it seemed desirable to determine, by a practical test, whether it possesses any disadvantages, and whether it can safely and advantageously be substituted for fresh milk in the routine feeding of infants.

During the past 15 months we have fed 668 infants on formulas prepared from evaporated milk, the composition of the final product being, in each instance, approximately the same as the individual would have been receiving had fresh milk been used. The length of time the formulas were fed varied from 2 weeks to 1 year, the average being 3½ months. In the majority of normal infants, feeding with evaporated milk was started during the first week of life. In addition, there were included 75 sick infants in a hospital service and out-patient department. These were suffering from a variety of conditions, including undernutrition, diarrhea, pyloric stenosis and various infections. Seven premature infants weighing from 1 to 5 pounds received evaporated milk as the exclusive food. The 668 infants were compared with 658 observed at the same time who received fresh cow's milk mixtures, or were exclusively breast fed, who came within approximately the same age limits, and included approximately the same distribution between normal infants and those suffering from various diseases.

Of the newly-born, 80 per cent regained the birth weight by the end of 14 day, as compared with 66 per cent in the control series. Of the normal infants followed for a period of months, the average gain in weight was 23.4 grams per day, as compared with 25.5 grams in the control series. The weight of those fed on evaporated milk at the end of the period of observation averaged 100.4 per cent of the theoretical normal weight for the respective ages, although the average weight at the time the feeding was begun was but 96.3 per cent of the theoretical, these figures being based upon the average weight of breast fed babies.

Of the hospital cases, which included all of the more seriously ill and difficult feeding problems, the average gain in weight was 18.5 grams per day as compared with 17.4 in the controls. There was no evidence that the development of those fed on evaporated milk was retarded. Dentition, sitting and walking occurred at the average normal time. There was no evidence of lack of resistance to infection. Although the observations extended over two summers, it was noteworthy that the infants fed on evaporated milk were, as a group, not subject to fermentative diarrheas. One of these developed eczema and two in the control series. Infants fed on evaporated milk for long periods were examined clinically and radiologically for evidence of rickets and none was found, nor was there any clinical evidence of scurvy. It should be noted that all received daily doses of cod liver oil and orange juice.

In addition to our own observations, a questionnaire was sent to a group of physicians who had been graduate students in our clinic, most of whom were practicing in rural districts, inquiring as to their experiences with the use of evaporated milk in the feeding of infants. To date no unfavorable replies have been received. A number of them have used evaporated milk almost exclusively.

Some stated that they considered it superior to fresh milk in most cases for well babies, and in all cases for the sick. Others commented on its superiority for use in rural districts, and among the poor who could not obtain suitable fresh milk, or did not have proper refrigeration. Some stated that they rarely saw the patients again after putting them on evaporated milk, as they did not thereafter suffer from feeding difficulties.

From this study it may be concluded that evaporated milk not only has no disadvantages but has considerable advantages over fresh milk for the feeding of both normal and sick infants.

Housing Betterment

THE Pennsylvania Legislature, which has just closed its session, worked for and against housing betterment, says the Philadelphia Housing Association.

Its contribution to housing progress is the Woodward Zoning Bill, introduced by Senator George S. Woodward, which, after a rather disheartening experience, passed the House and was signed by Governor John S. Fisher.

The Woodward Bill, which gives Philadelphia permission to adopt a zoning ordinance, will stand comparison with the zoning enabling acts on the statute books of over 30 states. It is modeled after and is practically a duplicate of the Standard State Zoning Enabling Act of the U. S. Department of Commerce. In addition, it authorizes a bureau of zoning, establishes penalties, and contains a validity section to care for adverse court decisions, if such should be rendered against any of its provisions. In signing this bill Governor Fisher has given Philadelphia the most far-reaching legislation of beneficial character which has passed the General Assembly in many years.

Prior to this action of the Governor, the City Council of Philadelphia, at the request of the Mayor, passed a resolution endorsing the Woodward Bill, and three Councilmen appeared at the hearing in Harrisburg and requested the enactment of the bill into law. Moreover, while this authority was being granted by the State Legislature, the councilmanic body enacted a companion piece of legislation creating a city planning commission. The agitation for this commission was begun some months ago by local organizations which persuaded the Mayor to call together 300 citizens to advise on the plans and scope of a planning commission. Following the enthusiastic reception of the proposal, Mayor Mackey prepared and sent to City Council an ordinance creating a committee of 15 members, which the Council passed in record time.

The outlook for the passage of a zoning ordinance and the appointment of a city planning commission for Philadelphia is most gratifying today. To all appearances, the efforts of the Housing Association for many years to further these two projects are about to reach fruition.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

EDITORIAL COMMITTEE

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ANOTHER ARGUMENT FOR PASTEURIZATION

SEPTIC sore throat was introduced to us in America, so to speak, by Boston, Brookline and Cambridge, in the spring of 1911, and since that time, recurring epidemics have taken a heavy toll of raw milk users. In spite of the various publications on the subject and the teaching of milk experts and sanitarians generally, we cannot escape the conclusion that the disease is too little considered, and that even health officers are not as much awake to the necessities of the case as they should be, though we express this opinion with full sympathy for the legal and technical difficulties which confront many of them in their official work.

The latest epidemic to attract wide attention occurred in Lee, Mass., in June and July, 1928. Lee is a town of 4,000 inhabitants. Within approximately 2 weeks, 950 people suffered from septic sore throat, and 48 died as a result. The outbreak was carefully studied epidemiologically and bacteriologically, so that we have an exact and clear account of it. A recent number of the *New England Journal of Medicine*[1] devotes considerable space to the matter, and gives as well an admirable historical review of the disease, going back as far as authentic accounts can be found. More than 60 epidemics have been recorded, involving more than 30,000 cases. From 1911 to 1928, inclusive, there have been in Massachusetts alone, 1,468 cases of typhoid fever, 74 of diphtheria, 1,147 of scarlet fever, and 3,986 of septic sore throat, attributed to milk as the carrier. During the same period, there have been only 369 cases of water-borne typhoid fever.

We cannot do better than to emphasize the points made by Bigelow and White,[2] who point out that in spite of our knowledge and insistence on protection of water supplies, our attempts at enforcing sanitary laws in regard to milk often meet with discouragement and

lack of sympathy on the part of consumers, and with distinct opposition on the part of producers and distributors.

Septic sore throat is due to a hemolytic streptococcus, usually of the *epidemicus* type, and is practically exclusively a milk-borne disease. Fortunately the streptococcus is comparatively easily killed by heat, so that even ordinary pasteurization will render a milk supply safe.

Among other important features brought out in the investigation of the Lee epidemic, two are of especially practical value—the apparent responsibility of a single cow, and the fact that an infected quarter may not show gross lesions, and produce milk of apparently normal character. One cow in an otherwise healthy herd showed distinct disease in the left front quarter, the milk from which had been excluded. However, the hind quarter on the same side, though apparently healthy, and giving milk of apparently good quality, was found to contain great numbers of the *S. epidemicus*. The animal was kept under observation for 2 months, during which time samples of milk were frequently examined. The two right quarters remained normal in appearance and negative for *S. epidemicus*. We must recognize that dairymen not infrequently use the milk from one or more quarters of a diseased udder.

Our only protection at present against this, as well as against other milk-borne diseases, is proper pasteurization. Once again, we wish to insist that with the exception of certified milk, all market milk should be pasteurized. In this lies our only safety against milk-borne diseases.

REFERENCE

1. Epidemic Septic Sore Throat—White, Benjamin. Part I. Historical Review; Holmes, May Salona. Part II. Study of the 1928 Epidemic in Massachusetts; Bigelow, George H., and White, Benjamin. Part III. Review of 1928 Epidemic in Massachusetts; *New Eng. J. Med.*, 200, 16: 797–809 (Apr. 18), 1929.

A PUBLIC HEALTH AWARD AT TULANE UNIVERSITY

THERE has been established at Tulane University, New Orleans, La., an award to be known as the "Geiger Medal," to be granted yearly to that student of the university, either senior or graduate, who prepares the best thesis on some phase of public health of particular interest to the southern states or countries contiguous to them.

The medal has been accepted by the Board of Administrators through President Dinwiddie. For the present session, the award will be made by a committee consisting of the head of the Department of English in the College of Arts and Sciences as chairman, the Dean of the School of Medicine, Professors Musser and Faust of the School of

Medicine, and Professor E. S. Hathaway of the College of Arts and Sciences.

We cannot but rejoice at this recognition of public health by our leading southern university.

The medal is named in honor of Dr. J. C. Geiger, at present Associate Professor of Epidemiology in the Medical School of the University of California. Dr. Geiger is well known for his epidemiological studies in connection with the work on botulism done by the U. S. Public Health Service with the Departments of Hygiene of the University of Chicago and the University of California. He was Assistant Health Commissioner of the City of Chicago, and was one of those who, to all intents and purposes, was dropped by Mayor Thompson.

THE THIRD CONFERENCE ON PUBLIC HEALTH

THE Third Annual Conference on Public Health, called by the American Medical Association, met in Chicago, Ill., March 29 and 30. The first day was devoted to a discussion of coöperation between official and voluntary health agencies and the medical profession, in the promotion of public health. This program was outlined by the committee appointed by the 1928 Conference.

The second day the work of the Hygienic Laboratory, especially research, was described, followed by a review of our knowledge of undulant fever and its relation to public health.

It will be remembered that much of the 1928 meeting was devoted to a somewhat heated discussion of the differences which had arisen over the conduct of a demonstration, some physicians believing themselves to be adversely affected. The meeting ended, however, with a sincere attempt on the part of all to reach an understanding, and to establish friendly relations. The 1929 meeting was largely devoted to furthering this same object.

There can be little doubt that some voluntary agencies have in the past blundered. They have invaded fields which have for many years been in the hands of physicians, and have not always been tactful, nor have they always brought to their aid the best medical advice. The resident physicians, and to some extent the medical profession in general, have resented these invasions. Irritation and opposition have developed which could almost certainly have been avoided by the exercise of tact and judgment—in other words, application of ethics.

The medical profession has for years recognized and welcomed public health work in the control of water and milk supplies, sewage

disposal, and even vaccination against smallpox. With the increasing number of diseases which can be prevented by immunization, a new factor has entered, in which the treatment of the individual, which has been a medical function, has been invaded. During these campaigns by voluntary agencies, much of the propaganda work has been done by nurses and others, perhaps physicians, brought in from the outside. There can be no doubt that the opposition of local physicians is based largely upon what they consider outside interference, though in some cases there is fear of having their means of living taken away from them by the prevention of disease.

Some foundations have recognized that their demonstrations have led the public to expect immunization free or at a minimum cost. When the campaign is over, the public is left high and dry, as far as the foundation is concerned, and must pay for further work, unless, as is sometimes the case, official health agencies take it over.

We believe that the more education there is along the lines of public health and preventive medicine, the more work the physician of the community will have to do, though there may be a period of readjustment, during which the private physician suffers.

A similar controversy arose over the establishment of official public health laboratories, those conducting private laboratories feeling that their work would be taken away from them. We do not pretend to have made an exhaustive survey of this matter, but many observations have convinced us that private laboratories are more numerous and doing a greater amount of work than ever before, and cannot escape the conviction that the official laboratories have trained the public to demand such service.

Essentially the same factors are involved in the relation between voluntary agencies and private physicians. If a voluntary or even an official agency sends bumptious men and women into the field, trouble will inevitably result. On the other hand, it has been abundantly proved that where tact is shown, physicians, with the exception of a few unfortunate characters always to be found, are willing and eager to coöperate and to acquire the newer knowledge. In this connection, we wish we could give the experiences of a certain foundation which has avoided the errors discussed.

The voluntary agency and the foundation are here to stay, whether we like it or not. Many of them are in the hands of non-medical executives, some of whom have judgment and tact, while some are devoid of these necessary qualities. Some are capable of learning, some apparently are not. We are strong in our belief that a working basis will be found, and that cordial relations will be established, not

only between voluntary and official health agencies, but between them and the medical profession. As well put, in one of the papers at the conference:

> The voluntary agency can best meet its responsibility by stimulating the individual citizen to insist upon a modern health service from his physician, by helping the physician to enlarge his scope of service and render a better service, and by helping the official agency to a stronger and more secure place in the governmental scheme.

It was finally agreed, on motion, that the chairman be requested to appoint a committee to consider the papers presented, and to draft such suggestions as might seem desirable for consideration at the next conference, all carrying the general idea of coöperation.

A NEW ASSOCIATION

ONE is always inclined to groan over the formation of a new society. Already the professional man is burdened with the number to which he belongs or should belong. It is impossible to attend all of the meetings, and difficult to keep up with the literature put out by the various societies; yet now and then there seems to be a real need for a new one, and this has been recognized by the foundation of the American Mouth Health Association, incorporated in Minnesota.

The avowed purposes of the association are to inform the public of the importance of mouth hygiene; to establish a central bureau of mouth health education with local branches throughout the country; to promote the teaching of healthful living, with especial reference to the mouth and teeth; and to give support to other health and welfare agencies.

An advisory board has been appointed, the first meeting of which was held in Rochester, Minn., May 17 and 18, where the prospectus of the association was discussed, stock taken, and outlines for the future tentatively determined. Some extremely interesting studies made at the Mayo Clinic were presented, illustrated with photographs, and the members were given the opportunity of seeing the experimental animals.

The importance of oral hygiene is being more and more recognized. It was regarded for a long time as a specialty in which only the dentist was interested, and his work was considered to lie largely in the correction of defects and repair of damage already done. The influence of the teeth and the mouth on the general health has not been recognized until comparatively recently, and even now its significance is not fully understood, though an imposing number of organic as well as functional derangements are known to have their

origin in, or to be adversely influenced by, infections of the gums, teeth or tonsils. With the study of focal infections there came a veritable orgy of tooth pulling, against which there is now a revulsion of feeling, though physicians are still referring cases to dentists more than formerly, and remarkable restorations to health follow the correction of defects and the removal of focuses of infection.

It was to be expected that the teeth would not escape attention in the intensive study of vitamins which has been going on. This in turn has brought a renewal of our interest in foods and diets in general.

We cannot but feel that there is an open field for this new association, and wish it great success. There is certainly something wrong with our habits when the vast majority of people—young and old—suffer from defective teeth and a train of disorders resulting therefrom. Our teeth have not kept pace with our changes in occupation and methods of living. We have perhaps become too much civilized. We live in an age of prepared and packaged foods, pre-chewed and often pre-digested. Will not a return to nature improve matters? The Sybarites disappeared from the world.

SAMUEL H. GILLILAND, V. M. D., M. D.

THE death of Dr. Samuel H. Gilliland on May 27, at the age of 51, removes a notable figure from the biological manufacturing world.

For many years he was associated with the late Dr. Leonard Pearson in the work of the State Live Stock Sanitary Board of Pennsylvania, and held a number of offices requiring expert knowledge as well as great executive ability, all of which he filled with credit to himself and advantage to those whom he served. He held the degrees of Doctor of Veterinary Medicine and Doctor of Medicine, both obtained from the University of Pennsylvania while he was carrying on his work in the laboratory of the State Live Stock Sanitary Board. He had made several trips to Europe for the purpose of study.

In Pennsylvania he held successively the offices of Director of the Laboratory of the State Live Stock Sanitary Board, Director of the Laboratories of the State Board of Health, and State Veterinarian. During the World War he was Director of the Laboratory for the training of veterinarians situated at the University of Pennsylvania, holding the commission of Major in the Medical Corps of the U. S. Army. Here veterinarians studied not only the contagious diseases of animals, but also serology and laboratory diagnostic work.

Dr. Gilliland was one of the pioneers in the study of immunity against tuberculosis, and, with the late Dr. Leonard Pearson, published, in 1902, " Some Experiments upon the Immunization of Cattle

against Tuberculosis." While similar work had been done before, we believe this was the first in the world which was carefully controlled by post-mortem observation and microscopical examination of the tissues. Subsequently Dr. Gilliland published several articles under his own name on the same subject. He also carried out extensive immunization experiments on some farms breeding only the highest class of cattle for the production of certified milk.

Dr. Gilliland was a member of our Association, and a Fellow; a member of the American Medical Association; Philadelphia Pathological Society; Philadelphia County Medical Society; University Club; Medical Club; National Tuberculosis Association; American Veterinary Medical Association; and the United States Live Stock Sanitary Association.

PROPOSED ENTERTAINMENTS AND TRIPS IN MINNEAPOLIS

Drive through Lake district to Glen Lake Sanatorium. Inspection. Buffet luncheon at Sanatorium (2¼ hours)

Dedication Exercises
University Public Health Pavilion
Luncheon (5 hours)

Drive to University Main Campus and Agricultural Campus (2½ hours)

Trip to Hospitals and Institutions for care and rehabilitation of the handicapped (4 hours)
- a. Michael Dowling School
- b. Minnesota Hospital for Crippled Children
- c. Shrine Hospital for Crippled Children
- d. Arthur J. Gillette State Hospital for Crippled Children

Visit through Social Service and Health Agencies (2 hours)
- a. Citizens' Aid Building
- b. Minneapolis Division of Health
- c. Lymanhurst School and Clinic
- d. Minneapolis General Hospital

Visit to the University Medical School, University Hospitals (2 hours)
- a. Cancer Institute
- b. Todd Memorial Clinic
- c. Institute of Child Welfare

Trip to the Water Purification Plants at Fridley Park and Columbia Heights (3 hours)

Trip to the Milk Producing, Pasteurizing, and Distributing Plants (3 hours)
- a. Franklin Co-Operative Creameries
- b. Hockney Dairy Farm, etc.

Trip to the Minneapolis Flour Mills (2 hours)
- a. Inspection of Food Products
- b. Luncheon

For visiting ladies
(Two alternative drives, 2 and 3 hours respectively)
Drive around the lakes and boulevards surrounding the city (a. or b.)
- a. Tea at Minneapolis Art Institute
- b. Tea at Woman's Club

Special Trip to the Mayo Clinic and the Mayo Foundation, Rochester, Minn., fast Railway service
- a. Research Health Clinic
- b. Luncheon

Opening Session—Monday, September 30, 8:00 P.M.—Nicollet Hotel
- a. Program
- b. General Reception
- c. Dance

Banquet—Thursday, October 3, 7:00 P.M.—Nicollet Hotel
- a. After dinner program
- b. Dance

A possible trip to the St. Paul Hospitals and Institutions (3 hours)

PRELIMINARY PROGRAM OF THE FIFTY-EIGHTH ANNUAL MEETING

AMERICAN PUBLIC HEALTH ASSOCIATION

Minneapolis, Minn., September 30–October 5, 1929

DELEGATES are urged to consult the Final Program, at the meeting, for information as to the exact time and place of sessions. The General Sessions will be held at the Hotel Nicollet. Section and other meetings will be held in the Municipal Auditorium. Morning sessions will be at 9:30; luncheon sessions at 12:30; afternoon sessions at 2:30; dinner sessions at 6:30; and evening sessions at 8:00.

General Sessions

First Session—Monday Evening

Addresses of Welcome

Address of the President of the American Public Health Association. George W. Fuller, Fuller & McClintock, New York, N. Y.

Address of the President or a Representative of the American Child Health Association.

Reception and Dancing

Banquet—Thursday Evening

No Title. George E. Vincent, Ph.D., President, The Rockefeller Foundation, New York, N. Y.

Dancing

Joint Sessions

CHILD HYGIENE SECTION AND AMERICAN ASSOCIATION OF SCHOOL PHYSICIANS

First Session—Monday Afternoon

The Rôle of the School Physician in a School Health Program. Charles H. Keene, M.D., Professor of Hygiene, University of Buffalo, Buffalo, N. Y.

Report of the Committee on Sickness Absence Records. *Chairman*, Don W. Gudakunst, M.D., Director, School Health Service, Health Department, Detroit, Mich.

The Value of a Survey of Senior Grades in Primary Schools in an Attempt to Evaluate the Present School Health Service. J. E. Davey, M.D., Chief School Medical Officer, Hamilton, Ont.

Training for School Health Workers. Sven R. Lokrantz, M.D., Medical Director, Los Angeles City Schools, Los Angeles, Calif.

Second Session—Tuesday Afternoon

School Health Work. How It May Be Improved. JOHN L. C. COFFIN, M.D., School Physician, Los Angeles City Schools, Los Angeles, Calif.

A Practicable Program of School Health Supervision in Secondary Schools. CHARLES H. KEENE, M.D., Professor of Hygiene, University of Buffalo, Buffalo, N. Y.

Suggested Measures for Increasing the Coöperation between the Family Physician, the Parent and School Health Staff. MARY E. CRAWFORD, M.D., Chief School Medical Officer, Winnipeg, Man.

Recording of Medical Examinations of School Children Leading to Credits. FRANCIS E. HARRINGTON, M.D., Commissioner of Health, Minneapolis, Minn.

CHILD HYGIENE AND PUBLIC HEALTH EDUCATION SECTIONS

First Session—Thursday Afternoon

Health Teaching in the Elementary Schools. IDA M. HASKINS, Director of Health Education, Public Schools, Mansfield, O.

The Rôle of the Classroom Teacher in a School Health Education Program. ANNE L. WHITNEY, Director of Health Education, American Child Health Association, New York, N. Y.

Training of Teachers for Health Education Work. ELMA ROOD, Director of Nursing, Peabody College for Teachers, Nashville, Tenn.

Second Session—Friday Afternoon

The Rôle of a School Superintendent in a School Health Program. R. G. JONES, Superintendent of Schools, Cleveland, O.

Discussion

Procedures for Inter-relating Health Teaching and Health Administration. WILLIAM DEKLEINE, M.D., American Red Cross, Washington, D. C.

Discussion

CHILD HYGIENE AND PUBLIC HEALTH NURSING SECTIONS

Friday Morning

Community-Wide Child Hygiene Program Including Official and Non-Official Health Agencies and the Medical Profession. MARY RIGGS NOBLE, M.D., Chief Preschool Division, Bureau of Child Health, State Department of Health, Harrisburg, Pa.

The Nurse's Message of Child Health to the Family and How She Can Get It Across under Varying Conditions. HELEN C. PECK, R.N., Executive Secretary, Infant Welfare Society, Minneapolis, Minn.

Discussion

How Can the Nurse Help the Health Officer to Get His Message Across?

From the Standpoint of the City—HENRY F. VAUGHAN, D.P.H., Commissioner of Health, Detroit, Mich.

From the Standpoint of the County—H. S. MUSTARD, M.D., Assistant to the Commissioner, State Department of Health, Nashville, Tenn.

Elements in the Home Controlling Infant Welfare Activity. AMELIA GRANT, R.N., Director, Bureau of Nursing, Department of Health, New York, N. Y.

FOOD, DRUGS AND NUTRITION AND PUBLIC HEALTH ENGINEERING SECTIONS

Thursday Afternoon

Low Per Capita Milk Consumption—A National Nutritional Problem. R. S. CRAIG, Director, Bureau of Chemistry and Food, City Health Department, Baltimore, Md.

The Significance of Thermophilic Bacteria in Market Milk. L. A. ROGERS, D.Sc., In Charge, Research Laboratories, Bureau of Dairy Industry, U. S. Department of Agriculture, Washington, D. C.

Discussion. HENRY F. VAUGHAN, D.P.H., Commissioner of Health, Detroit, Mich.

Results Achieved by a State-Wide Milk Sanitation Program. E. L. BISHOP, M.D., State Health Commissioner, and W. H. HASKELL, In Charge, Milk Sanitation, State Department of Health, Nashville, Tenn.

Discussion

A Practical Definition of Pasteurization. LESLIE C. FRANK, Sanitary Engineer in Charge, Milk Investigations, U. S. Public Health Service, Montgomery, Ala.

Discussion. GEORGE W. GRIM, V.M.D., Milk Control Officer, Ardmore, Pa.

LABORATORY AND EPIDEMIOLOGY SECTIONS

Friday Afternoon

The Common Cold, and How It Is Being Studied Epidemiologically. W. H. FROST, M.D., Johns Hopkins University, Baltimore, Md.

Field Studies in Respiratory Infections. WILSON G. SMILLIE, M.D., School of Public Health, Harvard University, Boston, Mass.

Bacteriological Findings in Pneumonia and Their Bearing on Epidemiology. WILLIAM H. PARK, M.D., Director of Laboratories, Department of Health, New York, N. Y.

HEALTH OFFICERS AND EPIDEMIOLOGY SECTIONS

Wednesday Afternoon

Opportunity and Status of Epidemiological Service in State and City Health Departments. JOHN A. FERRELL, M.D., International Health Board, New York, N. Y.

Practice and Results of the Epidemiological Work of the State Department of Health of California. W. H. KELLOGG, M.D., or JOHN N. FORCE, M.D., University of California, Berkeley, Calif.

Milk-Borne Septic Sore Throat and Scarlet Fever. CLARENCE L. SCAMMAN, M.D., Assistant State Commissioner of Health, Newtonville, Mass.

PUBLIC HEALTH ENGINEERING AND LABORATORY SECTIONS

Thursday Morning

The Use of Synthetic Dilution Waters for Bacteriological and Oxygen Demand Determinations. E. J. THERIAULT and C. T. BUTTERFIELD, Stream Pollution Investigations Station, U. S. Public Health Service, Cincinnati, O.

The Treatment of Creamery Wastes. L. F. WARRICK, State Sanitary Engineer, State Board of Health, Madison, Wis. (*Stereopticon Illustration.*)

Administrative Control of Waterways Pollution. W. L. STEVENSON, Chief Engineer, State Department of Health, Harrisburg, Pa.

The Administrative Significance of Proposed Changes in Standard Methods of Water Analyses. JOHN F. NORTON, PH.D., Director of Laboratories, Department of Health, Detroit, Mich.

Discussion. J. J. HINMAN, JR., University of Iowa, Iowa City, Ia., and ABEL WOLMAN, Chief Engineer, State Department of Health, Baltimore, Md.

PUBLIC HEALTH ENGINEERING AND CONFERENCE OF STATE SANITARY ENGINEERS

Dinner Session—Tuesday Evening

SECTION SESSIONS

LABORATORY

First Session—Tuesday Morning

The Streptococcus of Septic Sore Throat. WILLIAM D. FROST, M.D., R. C. THOMAS, MILDRED GUMM and MYRTLE SHAW, University of Wisconsin, Madison, Wis.

The Opsonic Method for Identification of Scarlet Fever Streptococci—Its Applicability for the Detection of Carriers. RUTH TUNNICLIFF, M.D., Chicago, Ill.

Anti-Streptococcus Serum in Scarlet Fever. A. B. WADSWORTH, M.D., State Department of Health Laboratory, Albany, N. Y.

The Relationships of the Hemolytic Streptococci Causing Erysipelas. ANNA W. WILLIAMS, M.D., Research Laboratory, Department of Health, New York, N. Y.

Meningitis. JOHN F. NORTON, PH.D., Director of Laboratories, Department of Health, Detroit, Mich.

Second Session—Wednesday Morning

Report of the Committee on Training and Personnel. THOMAS G. HULL, PH.D., State Department of Health, Springfield, Ill.

Standardization of the Wassermann Test. RUTH GILBERT, M.D., Division of Laboratories and Research, State Department of Health, Albany, N. Y.

Report of the Committee on Standard Methods. *Chairman,* EDWIN O. JORDAN, PH.D., University of Chicago, Chicago, Ill.

Report of the Committee on Abstracts in the Journal. *Chairman,* C. C. YOUNG, D.P.H., Department of Health Laboratory, Lansing, Mich.

Report of the Committee to Confer with the Association Committee on Dairy Products. *Chairman,* ROBERT S. BREED, PH.D., New York Agricultural Experiment Station, Geneva, N. Y.

Mediterranean Fever as Observed in the Mediterranean Countries. I. FOREST HUDDLESON, D.V.M., Michigan State College, East Lansing, Mich.

Tularemia. R. G. GREEN, M.D., and E. M. WADE, State Board of Health, Minneapolis, Minn.

The Study of Cultures of Monilia Isolated from Sputum. RUTH GILBERT, M.D., and W. M. GROESBECK, Division of Laboratories and Research, State Department of Health, Albany, N. Y.

The Sanitary Significance of Thermophilic Bacteria in Milk. ROBERT S. BREED, PH.D., New York Agricultural Experiment Station, Geneva, N. Y.

The Applicability of the Direct B. Coli Aerogenes Count Obtained with Cyanide Citrate Agar to the Scoring of Shell Fish. FRED O. TONNEY, M.D., City Hall, and RALPH E. NOBLE, Chicago, Ill.

HEALTH OFFICERS

First Session—Tuesday Afternoon (*Closed Session*)

Health Department Administrative Problems, such as Salaries, Hours of Work, Vacations, Sickness Leave, Pensions, and Other Rules and Regulations. GEORGE C. RUHLAND, M.D., Health Commissioner, Syracuse, N. Y.

Discussion

National Health Contest of the U. S. Chamber of Commerce. JOHN L. RICE, M.D., Health Officer, New Haven, Conn.

Discussion. Representative of the U. S. Chamber of Commerce.

The Appraisal Form. W. F. WALKER, D.P.H., Field Director, Committee on Administrative Practice, American Public Health Association, New York, N. Y.

Discussion

Discussion of the Report of the Committee on Coöperation, Development and Finance. LOUIS I. HARRIS, M.D., General Director, Public

Health Service, National Dairy Products Corporation, New York, N. Y.

Dinner Session—Tuesday Evening (*Closed Session*)

The Place of the American Public Health Association in Public Health and the Part the Health Officer Can Play. GEORGE W. FULLER, Fuller & McClintock, New York, N. Y.

Second Session—Thursday Morning

PROGRESS REPORTS FROM THE COMMITTEE ON ADMINISTRATIVE PRACTICE:

a. **The Care of Communicable Diseases in General Hospitals.** D. L. RICHARDSON, M.D., Superintendent, Providence City Hospital, Providence, R. I.

b. **Health Department Record Forms.** GEORGE C. RUHLAND, M.D., Health Commissioner, Syracuse, N. Y.

c. **High Points in County Health Work.** C.-E. A. WINSLOW, DR.P.H., Yale University, New Haven, Conn., and E. L. BISHOP, M.D., State Health Commissioner, Nashville, Tenn.

Reporting of County Health Work. H. S. MUSTARD, M.D., Assistant to the Commissioner, State Department of Health, Nashville, Tenn.

Discussion. DOUGLAS L. CANNON, M.D., State Health Commissioner, Montgomery, Ala.

Training of Health Officers. JOSEPH W. MOUNTIN, M.D., State Department of Health, Nashville, Tenn.

Discussion. M. E. BARNES, M.D., Commissioner of Health, Greenville, O.

VITAL STATISTICS

First Session—Tuesday Afternoon

SPECIAL SESSION ON CANCER

Announcement of the Purpose of the Session. *Chairman*, GEORGE H. VAN BUREN, Metropolitan Life Insurance Company, New York, N. Y.

The Need for Cancer Morbidity Statistics. FRANCIS C. WOOD, M.D., Professor and Director of the Institute of Cancer Research, Columbia University, New York, N. Y.

Problems of Cancer Mortality Statistics. H. E. ROBERTSON, M.D., Professor of Pathology, The Mayo Foundation, University of Minnesota, Rochester, Minn.

Economic Aspect of the Cancer Problem. RAYMOND PEARL, PH.D., Director, Institute of Biological Research, Johns Hopkins University, Baltimore, Md.

What Can Be Done to Give Cancer Statistics a Greater Popular Appeal?

Second Session—Wednesday Morning

Section Business.

Report of the Committee on Accuracy of Certified Causes of Death and Its Relation to Mortality Statistics and the International List.

Chairman, HAVEN EMERSON, M.D., Department of Public Health Administration, Columbia University, New York, N. Y.

Report of the **Committee on Public Health Climatology.** *Chairman,* E. W. KOPF, Metropolitan Life Insurance Company, New York, N. Y.

Report of the **Committee to Coöperate with the National Safety Council in Preparing Forms for Additional Information Regarding Accidents.** *Chairman,* W. THURBER FALES, Sc.D., State Registrar, State Board of Health, Montgomery, Ala.

Report of the **Committee on Registration Affairs.** *Acting Chairman,* T. F. MURPHY, M.D., U. S. Bureau of the Census, Washington, D. C.

Some **Difficulties in the Collection of Records.** STEWART G. THOMPSON, D.P.H., Director, Bureau of Vital Statistics, State Board of Health, Jacksonville, Fla.

Discussion. W. A. DAVIS, M.D., Registrar, Bureau of Vital Statistics, State Department of Health, Austin, Tex.

The **Preparation and Publication of Basic Statistical Tables.** L. W. HUTCHCROFT, Statistician, State Board of Health, Madison, Wis.

Discussion. F. M. REGISTER, M.D., Director, Bureau of Vital Statistics, State Board of Health, Raleigh, N. C.

No Title. SHIRLEY W. WYNNE, M.D., Commissioner of Health, New York, N. Y.

Third Session—Wednesday Afternoon

Report of the **Committee to Aid Completion of the Registration Area.** *Chairman,* LOUIS I. DUBLIN, PH.D., Statistician, Metropolitan Life Insurance Company, New York, N. Y.

Report of the **Committee on Proper Allocation of Records.** *Chairman,* J. V. DEPORTE, PH.D., Director, Division of Vital Statistics, State Department of Health, Albany, N. Y.

The Need of **Better Occupation Returns on Death Certificates.** T. F. MURPHY, M.D., U. S. Bureau of the Census, Washington, D. C.

Are the **Indians Dying Out?** FREDERICK L. HOFFMAN, LL.D., Consulting Statistician, Prudential Life Insurance Company, Newark, N. J.

The Variability **Exhibited by Different States in the Seasonal Incidence of Typhoid Fever.** GAIUS E. HARMON, M.D., Department of Hygiene and Bacteriology, School of Medicine, Western Reserve University, Cleveland, O.

The Rise and Fall of **Measles Susceptibles with Epidemic Cycles** over a **Thirty-Year Period in Baltimore.** A. W. HEDRICH, Sc.D., Instructor in Vital Statistics and Epidemiology, Johns Hopkins University, Baltimore, Md. (*Stereopticon Illustration.*)

Fourth Session—Thursday Afternoon

Report of **Visits to Local Registrars of Vital Statistics in Maryland.** JOHN COLLINSON, M.D., Chief, Bureau of Vital Statistics, State Department of Health, Baltimore, Md.

Tabulation of **Causes of Stillbirths, Deaths of Very Young Infants,** and Maternal **Deaths.** HENRY B. HEMENWAY, M.D., State Department of Health, Springfield, Ill.

A Setback in Mid-Life Mortality. LOUIS I. DUBLIN, PH.D., Statistician, Metropolitan Life Insurance Company, New York, N. Y.

The Occurrence of Influenza in a Group of Cities since 1918. SELWYN D. COLLINS, Associate Statistician, U. S. Public Health Service, Washington, D. C.

The Organization of Local Health Area Statistics in Two Hundred and Seventy Districts throughout New York City. GODIAS J. DROLET, Statistician, New York Tuberculosis and Health Association, and WILLIAM H. GUILFOY, M.D., Registrar of Records, Department of Health, New York, N. Y.

PUBLIC HEALTH ENGINEERING

First Session—Tuesday Morning

Sanitary Aspects of Collection and Disposal of Refuse (Report of the Committee on Refuse Collection and Disposal). *Chairman,* KENNETH ALLEN, City Sanitary Engineer, New York, N. Y.

The Disposal of Sewage Sludge (Report of the Committee on Sewage Disposal). *Chairman,* C. K. CALVERT, Sanitary Engineer, Indianapolis, Ind.

Sewage Disposal in Minneapolis and St. Paul. J. A. CHILDS, Chief Engineer, Metropolitan Drainage Commission, St. Paul, Minn.

Discussion. C. F. KEYES, Chairman, Metropolitan Drainage Commission, Minneapolis, Minn.

A Model Plumbing Ordinance vs. a Statewide Code. H. F. FERGUSON, Chief Sanitary Engineer, State Department of Health, Springfield, Ill.

Essential Features in the Design of Sanitary Drinking Fountains (Report of the Committee on Plumbing). *Chairman,* C. A. HOLMQUIST, Director, Division of Sanitation, State Department of Health, Albany, N. Y.

Second Session—Wednesday Morning

Bacterial Aftergrowths in Water Distribution Systems (Report of the Committee on Water Supply). *Chairman,* JOHN R. BAYLIS, Chemist, Experimental Filtration Plant, Chicago, Ill.

Water Treatment with Chlorinated Copperas. A. CLINTON DECKER, Sanitary Engineer, Tennessee Coal, Iron and Railroad Company, Birmingham, Ala., and H. G. MENKE, Assistant Sanitary Engineer, State Board of Health, Montgomery, Ala.

New Standards for Public Bathing Beaches and Wading Pools (Report of the Committee on Bathing Places). *Chairman,* STEPHEN DEM. GAGE, Sanitary Engineer, State Board of Health, Providence, R. I.

New Aspects of Shellfish Sanitation (Report of the Committee on Shellfish Supply). *Chairman,* H. D. PEASE, M.D., New York, N. Y.

Section Business and Election of Officers.

Third Session—Wednesday Afternoon

Preparedness for Disasters (Report of the Committee on Disaster Relief). *Chairman,* E. L. FILBY, Chief Engineer, State Board of Health, Jacksonville, Fla.

Lost Ultra-Violet Light Value in Urban Sunshine Due to Air Pollution. FRED O. TONNEY, M.D., and PAUL F. SOMERS, Bureau of Laboratories and Research, Department of Health, Chicago, Ill.

Some Special Problems in Atmospheric Pollution. ABEL WOLMAN, Chief Engineer, State Department of Health, Baltimore, Md.

Appraisal of Public Health Engineering Activities in City Health Work (Report of the Committee on Record Forms). *Chairman,* A. F. ALLEN, Health Officer, Coral Gables, Fla.

Essential Public Health and Economic Values of Mosquito Control (Report of the Committee on Mosquito Control). *Chairman,* LEWIS E. JACKSON, Hudson County Mosquito Extermination Commission, Jersey City, N. J.

INDUSTRIAL HYGIENE

First Session—Thursday Morning

What O'clock Is It in Industrial Hygiene? *Chairman's Address.* FRANK L. RECTOR, M.D., Executive Director, Chicago Medical Association, Chicago, Ill.

Section Business.

The Present Status of the Benzol Hazard in Industry. P. W. GUMAER, PH.D., The Barrett Company, New York, N. Y.

Discussion

Report of the Committee on Volatile Solvents. *Chairman,* ALICE HAMILTON, M.D., Harvard School of Public Health, Boston, Mass.

Discussion

Medical Services on an Ocean Liner. L. J. MILLAN, M.D., Medical Examiner, Bureau of Operations, U. S. Shipping Board, Baltimore, Md.

Discussion

Physical Impairment among Office Workers (A Report on One Thousand Physical Examinations of Sedentary Workers). WILLIAM A. MUHLBERG, M.D., Medical Director, The Union Central Life Insurance Company, and CAREY P. MCCORD, M.D., Medical Director, The Industrial Health Conservancy Laboratories, Cincinnati, O.

No Title. FLOYD P. ALLEN, M.D., Public Health Federation, Cincinnati, O.

Discussion. CHARLES A. NEAL, M.D., State Health Commissioner, Columbus, O., and I. C. RIGGIN, M.D., Director, American Heart Association, New York, N. Y.

Compensation for Occupational Diseases (Report of the Committee on Standard Practices in the Problem of Compensation of Occupational Diseases). *Chairman,* A. J. LANZA, M.D., Assistant Medical Director, Metropolitan Life Insurance Company, New York, N. Y.

Discussion

Luncheon Session—Thursday

The Worker and His Health. L. J. ZOELLER, Director of Personnel, Manufacturing Division, The Procter and Gamble Company, Cincinnati, O.

ROUND TABLE DISCUSSION OF THE OBJECTIVES OF INDUSTRIAL HYGIENE, TO INCLUDE:

Report of the Committee on Tuberculosis in Industry. *Chairman,* T. LYLE HAZLETT, M.D., Western Electric and Manufacturing Company, East Pittsburgh, Pa.

and

Report of the Committee on Industrial Morbidity Statistics. *Chairman,* WADE WRIGHT, M.D., Metropolitan Life Insurance Company, New York, N. Y.

Second Session—Friday Morning

Medical Services in Department Stores. W. JACOBSOHN, M.D., Department of Health, New York, N. Y.

Discussion. A. J. LANZA, M.D., Assistant Medical Director, Metropolitan Life Insurance Company, New York, N. Y.

Dusty Lung Diseases (Report of the Committee on Silicosis). *Chairman,* R. R. SAYERS, M.D., Chief of Health and Safety Section, U. S. Bureau of Mines, Washington, D. C.

Discussion

Toxicity of High Temperature Coal Tar Distillates (Report of the Committee on High Temperature Coal Tar Distillates). *Chairman,* G. H. GEHRMANN, E. I. DuPont de Nemours Company, Wilmington, Del.

Discussion

The Promotion of Health in the Manufacture of Wheat Products. No Author.

Discussion

New Skin Irritants (Report of the Committee on Skin Irritants). *Chairman,* HENRY F. SMYTH, M.D., Laboratory of Hygiene, University of Pennsylvania, Philadelphia, Pa.

Third Session—Friday Afternoon

Section Business and Election of Officers.

Occurrence, Effect and Treatment of Hydrogen Sulphide Poisoning in Industry. W. P. YANT, Supervising Chemist, Health and Laboratory Section, Bureau of Mines, Pittsburgh, Pa.

Discussion

Report of the Committee on Industrial Fatigue. *Chairman,* EUGENE L. FISK, M.D., Medical Director, Life Extension Institute, New York, N. Y.

Discussion

Lead Poisoning in the Brass and Bronze Industries. FRANK D. PEDLEY, M.D., and R. V. WARD, M.D., The Industrial Clinic of Montreal General Hospital, Montreal, Que.

Standard **Procedures in Lead Poisoning** (Report of the Committee on Lead Poisoning). *Chairman,* EMERY R. HAYHURST, M.D., College of Medicine, Ohio State University, Columbus, O.

Discussion

Anthrax **as an Occupational Disease** (Report of the Committee on Industrial Anthrax). *Chairman,* HENRY F. SMYTH, M.D., Laboratory of Hygiene, University of Pennsylvania, Philadelphia, Pa.

Discussion

Industrial **Hygiene in Soviet Russia.** PROFESSOR E. KAGAN, Institute for Pathology and Hygiene of Labor, Charkow, Russia.

Meeting of Section Council.

FOOD, DRUGS AND NUTRITION

First Session—Friday Morning

Report of **the Committee on Dairy Products and Eggs.** *Chairman,* J. H. SHRADER, PH.D., National Dairy Products Corporation, Baltimore, Md.

The Health **of Anabolic Nutrition.** FRANCIS L. BURNETT, M.D., Boston, Mass.

The Arsenic **Content of Tobacco.** E. G. LEMAY, State Department of Health, Austin, Tex.

The Vitamin **Content of Ethylene-Treated and Untreated Tomatoes** at Various **Stages of Development.** D. BREESE JONES, PH.D., and E. M. NELSON, PH.D., U. S. Department of Agriculture, Washington, D. C.

The Problem **of Sweets for Children** (Report of the Committee on Nutritional Problems). *Chairman,* HENRY C. SHERMAN, PH.D., Professor of Chemistry, Columbia University, New York, N. Y.

Luncheon Session—Friday

Election of Officers.

Second Session—Friday Afternoon

Protein in **the Diet** (Report of the Committee on Meats, Fish and Shellfish). *Chairman,* W. H. LIPMAN, M.D., Swift and Company, Chicago, Ill.

The Vitamin **Content of Food in Relation to Health.** HAZEL E. MUNSELL, PH.D., Bureau of Home Economics, U. S. Department of Agriculture, Washington, D. C.

Bacteriological **Control in Commercial Canning.** E. J. CAMERON, PH.D., and H. M. LOOMIS, National Canners' Association, Washington, D. C.

No Title. WALTER H. EDDY, PH.D., Professor of Physiological Chemistry, Teachers' College, Columbia University, New York, N. Y.

Report of **the Committee on Cereals and Their Products.** *Chair-*

man, F. C. BLANCK, PH.D., Bureau of Chemistry and Soils, U. S. Department of Agriculture, Washington, D. C.

Report of the Committee on Medicinal Products. *Chairman,* A. J. CRAMP, M.D., Chicago, Ill.

CHILD HYGIENE

First Session—Wednesday Morning

Morbidity and Mortality of Mothers and Newly-Born Infants. JOHN O. POLAK, M.D., Brooklyn, N. Y.

Effect of Antepartum Care of the Mother. BLANCHE M. HAINES, M.D., Children's Bureau, U. S. Department of Labor, Washington, D. C.

Effect of Prenatal Care on the Infant. HENRY F. HELMHOLZ, M.D., Mayo Clinic, Rochester, Minn.

Effect of Intrapartum Care on the Mother. J. P. GREENHILL, M.D., Chicago, Ill.

Effect of Intranatal Care on the Infant. ISAAC A. ABT, M.D., Professor of Pediatrics, Northwestern University Medical School, Chicago, Ill.

Effect of Postnatal Care on the Infant. FREDERIC W. SCHULTZ, M.D., University of Minnesota, Minneapolis, Minn.

Effect of Postpartum Care on the Mother. J. C. LITZENBERG, M.D., Minneapolis, Minn.

The Development of Maternal and Early Infant Care in Its Relation to a Public Health Program. F. J. UNDERWOOD, M.D., State Board of Health, Jackson, Miss.

Discussion. WILLIAM F. KING, M.D., State Health Commissioner, Indianapolis, Ind.

Second Session—Wednesday Afternoon

Report of the Committee on the Status of Maternal and Infant Mortality. *Chairman,* JULIUS LEVY, M.D., Director of Child Hygiene, Department of Health, Newark, N. J.

Coöperation of the Rank and File of the Medical Profession in a Study of Maternal and Infant Mortality. C. F. WILINSKY, M.D., Director, Beth Israel Hospital, Boston, Mass.

The Well Baby Clinic and the Office of the Family Physician and Pediatrician. E. J. HUENKENS, M.D., Director of Infant and Preschool Work, Infant Welfare Society, Minneapolis, Minn.

Third Session—Thursday Morning

What Constitutes Mental Health in the Preschool Child? HERBERT E. CHAMBERLAIN, M.D., Director, Child Guidance Clinic, Minneapolis, Minn.

The Relation of Teeth to the Health of the Preschool Child. PERCY R. HOWE, D.D.S., Chief of Research Laboratory, Forsyth Dental Infirmary, Boston, Mass.

The **Significance of Proper Posture in the Preschool Child.** No Author.

or

The **Extent to Which Health Departments Are Justified in Maintaining Free Mental, Dental, Postural and Nutritional Clinics for the Preschool Child.** No Author.

PUBLIC HEALTH EDUCATION

First Session—Tuesday Afternoon

ESTABLISHED POINTS IN A COMMUNITY PROGRAM OF HEALTH EDUCATION:

a. **The Health Department's Program.** HENRY F. VAUGHAN, D.P.H., Commissioner of Health, Detroit, Mich.

b. **The Voluntary Health Agency's Field.** BLEECKER MARQUETTE, Public Health Federation, Cincinnati, O.

c. **The School's Health Program.** WILLIS A. SUTTON, Superintendent of Schools, Atlanta, Ga.

Dinner Session—Tuesday Evening

Section Business. Closed Session for members and Fellows of Section.

Luncheon Session—Wednesday

Chairman, RAY H. EVERETT, LL.B., American Social Hygiene Association, New York, N. Y.

Health **Education Questions and Answers.** A. T. MCCORMACK, M.D., State Health Officer, Louisville, Ky.

Second Session—Wednesday Afternoon

Health **Education as a Community Asset** (*A Summary of the First Session*). IRA V. HISCOCK, Yale University, New Haven, Conn.

Discussion. MARY S. ROUTZAHN, Russell Sage Foundation, New York, N. Y.

Luncheon Session—Thursday

Chairman, PHILIP S. PLATT, New York Tuberculosis and Health Association, New York, N. Y.

Develop **Health Education in Your Clinics!**

Third Session—Friday Morning

What to **Tell** (*A Clinic Session on the Scientific Content of Health Educational Pamphlets, Posters, Exhibits, et al.*).

Chief Clinician—IAGO GALDSTON, M.D., Bureau of Health Education, New York Tuberculosis and Health Association, New York, N. Y.

Associate Clinician—EVART G. ROUTZAHN, Russell Sage Foundation, New York, N. Y.

PUBLIC HEALTH NURSING

Luncheon Session—Thursday (*Closed Session*)

Where Should the Nursing Division Stand in State Departments of Health? A. T. McCORMACK, M.D., State Health Officer, Louisville, Ky.

Discussion

Salary Schedules and Their Effect on Quality of Service. GRACE Ross, R.N., Superintendent of Nurses, Department of Health, Detroit, Mich.

First Session—Thursday Afternoon

(Continuation of Luncheon Session)

Civil Service and the Best Possible Medium That Can Be Developed in Standardizing the Appointments of Qualified Public Health Nurses. AMELIA GRANT, R.N., Director, Bureau of Nursing, Department of Health, New York, N. Y.

Discussion

Public Health Nursing Legislation. What It Should Include. MATHILDE S. KUHLMAN, R.N., Director, Division of Public Health Nursing, State Department of Health, Albany, N. Y.

What the Duties of a Communicable Disease Nursing Staff in the Health Department Should Be. AGNES J. MARTIN, R.N., Director, Bureau of Nursing, Department of Health, Syracuse, N. Y.

Discussion

Second Session—Friday Afternoon

What Should Be Included in the First-Aid Cabinet of a School Nurse? and What Should Her Standing Orders Be for First-Aid and Her School Nursing Procedure? CHARLES C. WILSON, M.D., Director of Health, Department of Health Education, Public Schools, Evansville, Ind.

What Is an Adequate Program of Supervision in Rural Communities Where the Problem Is Complicated by the Area to Be Covered —Equipment of the Staff, Nature of the Service, etc.? PEARL McIVER, R.N., Director, Public Health Nursing, Division of Child Hygiene, State Board of Health, Jefferson City, Mo.

Discussion

What, If Any, Is the Difference in the Need for Morbidity Care by a Public Health Nursing Staff in a Rural Community as Compared with an Urban Community? Is Less Service Required? If So, Why? ELIZABETH L. SMELLIE, R.N., Chief Superintendent, Victorian Order of Nurses for Canada, Ottawa, Ont.

Discussion

How Far Can a Public Health Nurse Assume Responsibility for the Social Phase of Her Health Work without Jeopardizing Her Primary Objective? KATHERINE FAVILLE, R.N., Department of Nursing Education, Teachers College, Columbia University, New York, N. Y.

What **Preparation Should the Public Health Nurse Have for Rural Work?** I. MALINDE HAVEY, Assistant Director, Public Health Nursing Service, American Red Cross, Washington, D. C.

EPIDEMIOLOGY

First Session—Tuesday Afternoon

Section Business and Election of Officers.

The **Influenza Epidemic of 1928–1929 in the United States.** SELWYN D. COLLINS, PH.D., Statistical Office, U. S. Public Health Service, Washington, D. C.

What **We Know of Influenza and How We May Add to Our Knowledge.** EDWIN O. JORDAN, PH.D., University of Chicago, Chicago, Ill.

Second Session—Thursday Afternoon

Practical **Points in Technic of Field Epidemiology.** FRANK W. LAIDLAW, M.D., District State Health Officer, Middletown, N. Y.

Relation **between Collection and Use of Epidemiological Data.** V. L. ELLICOTT, Epidemiologist, Health Department, Baltimore, Md.

Seasonal **and Age Studies of Poliomyelitis and What They Suggest.** W. LLOYD AYCOCK, M.D., Harvard Medical School, Boston, Mass.

MEETINGS OF OTHER ORGANIZATIONS

AMERICAN CHILD HEALTH ASSOCIATION

This organization will participate in the sessions of the Child Hygiene Section of the American Public Health Association. It will also hold an all-day meeting as follows:

First Session—Friday Morning

PRINCIPLES OF SOCIAL RESEARCH

Scientific **Progress in Education.** By an Educator.

Biometrics **Applied to Public Health.** RAYMOND H. FRANZEN, PH.D., Research Director, School Health Study, American Child Health Association, New York, N. Y.

Second Session—Friday Afternoon

WEIGHT, GROWTH AND NUTRITION

Chairman, THOMAS D. WOOD, M.D., Columbia University, New York, N. Y.

Introductory **Remarks by the Chairman.**

Results of **the School Health Study.** RAYMOND H. FRANZEN, PH.D., Research Director, School Health Study, American Child Health Association, New York, N. Y.

Clinical Diagnosis of Nutrition. LOUIS C. SCHROEDER, M.D., Chief, Pediatric Clinic, New York Nursery and Child's Hospital, New York, N. Y.

Contributions of Anthropometry to an Understanding of Growth and Nutrition. By an Anthropologist.

Discussion

AMERICAN ASSOCIATION OF SCHOOL PHYSICIANS

First Session—Monday Morning

Address of Welcome. A. J. CHESLEY, M.D., Secretary and Executive Officer, State Department of Health, St. Paul, Minn.

President's Address. JOHN A. CECONI, M.D., Director, Department of School Hygiene, Public Schools, Boston, Mass.

The Importance of Standardizing Light in Testing Vision of School Children. B. FRANKLIN ROYER, M.D., Medical Director, National Society for the Prevention of Blindness, New York, N. Y.

Modern Methods of Testing Hearing with Special Reference to the Audiometer. A. M. KERR, M.D., Medical Supervisor, Public Schools, Pittsburgh, Pa.

Mental Safety for School Children. HERBERT E. CHAMBERLAIN, M.D., Director, Child Guidance Clinic, Minneapolis, Minn.

Physical Safety for School Children. MARION TELFORD, National Safety Council, Chicago, Ill.

Discussion

Question Box

Second Session—Monday Evening

Association Business and Election of Officers.

When Should Tonsils Be Removed? Standard Recommendations for School Physicians. J. L. BOWMAN, M.D., Health Officer, Montgomery, Ala.

The Relation of the Nutritionist to a School Health Program. CLYDE B. SCHUMAN, Director, Nutrition Service, American Red Cross, Washington, D. C.

Discussion

Question Box

Third Session—Tuesday Morning

No Title. HARRY B. BURNS, M.D., Director, Department of Hygiene, Pittsburgh, Pa.

Health Education in the Houston Public Schools. H. K. READ, M.D., Supervisor of Hygiene, Houston, Tex.

New Jersey's Continuous Child Health Program. JULIUS LEVY, M.D., Director of Child Hygiene, Department of Health, Newark, N. J.

The Selection of School Physicians. LYMAN W. CHILDS, M.D., Supervisor of Health Service, Board of Education, Cleveland, O.

Discussion

Question Box

Dinner Session—Tuesday Evening

Presiding Officer, JOHN A. CECONI, M.D., Director, Department of School Hygiene, Public Schools, Boston, Mass.

Presentation of New Officers.

Greetings from the American Public Health Association. J. H. MASON KNOX, JR., M.D., Department of Health, Baltimore, Md.

Presentation of Ling Foundation Medal to William A. Howe, M.D. By SVEN LOKRANTZ, M.D., Medical Director, Los Angeles City Schools, Los Angeles, Calif.

Health Value in Education. JAMES M. MCCONNELL, State Commissioner of Education, St. Paul, Minn.

Health a Prerequisite for Education. MATTHIAS NICOLL, JR., M.D., State Commissioner of Health, Albany, N. Y.

Coöperation by Health Education and Health Service. HUGH S. CUMMING, M.D., Surgeon General, U. S. Public Health Service, Washington, D. C.

INTERNATIONAL SOCIETY OF MEDICAL HEALTH OFFICERS

Sunday, September 29—2:30 P.M.

Meeting of the Organization Committee.

Monday, September 30—9:00 A.M.

Meeting of the Organization Committee.

Monday, September 30—2:30 P.M.

Organization Meeting of Members.

a. Adoption of Constitution and By-laws.

b. The Purpose of Our Organization. ARNOLD H. KEGEL, M.D., Commissioner of Health, Chicago, Ill.

c. Election of Officers.

Monday, September 30—4:30 P.M.

Meeting of the Executive Committee.

AMERICAN SOCIAL HYGIENE ASSOCIATION AND MINNESOTA SOCIAL HYGIENE COMMITTEE

Dinner Session—Friday

Chairman, WILLIAM F. SNOW, M.D., General Director, American Social Hygiene Association, New York, N. Y.

Evening Session—Friday

Chairman, MRS. DAVID F. SIMPSON, Minneapolis, Minn.

Social Hygiene and Social Progress. VALERIA H. PARKER, M.D., President, National Council of Women, New York, N. Y.

Social Hygiene and Public Health. C.-E. A. WINSLOW, DR.P.H., Yale University, New Haven, Conn.

CONFERENCE OF STATE LABORATORY DIRECTORS

The Conference of State Laboratory Directors will be held in Minneapolis on Monday, September 30, at 3 P.M., with dinner at 6. As in previous years, the meeting will be very informal, with particular attention paid to those problems which are peculiar to the administration of state laboratories.

NORTHWEST CONFERENCE OF CHILD HEALTH AND PARENT EDUCATION

This conference plans to hold a morning session followed by luncheons on Wednesday, and an evening session on the same day; also a morning session on Thursday.

MINNESOTA STATE SANITARY CONFERENCE

There will be no formal program.

MINNESOTA STATE PUBLIC HEALTH ASSOCIATION

MINNESOTA STATE ORGANIZATION FOR PUBLIC HEALTH NURSING

HOTELS

Make your hotel reservation well in advance. For a list of hotels see the May JOURNAL, page 543.

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HOTEL RESERVATION BLANK

To .....
(Name of Hotel)

Please reserve for me.....rooms for.....persons for the A. P. H. A. Meeting. (Cross [X] is placed after my preference.)

Single room.....Double room.....

Maximum rate per day for room $.....Minimum rate per day for room $.....

I expect to arrive..... If date of arrival is changed I will notify you at least 24 hours in advance.

Please acknowledge this reservation.

Name .....

Street Address .....

City ..... State .....

ASSOCIATION NEWS

SEDGWICK MEDAL AWARD

The American Public Health Association announces that the first award of the Sedgwick Memorial Medal will be considered in 1929. This award was established in honor of the late Professor William Thompson Sedgwick, a former President of the American Public Health Association. The fund which provides the medal was raised by popular subscription from Professor Sedgwick's former students and friends. It is to be awarded for distinguished service in public health.

Except for the fact that it is limited to the recognition of service in the field of public health, there is no restriction as to the special line of service that will be considered. Administration, research, education, technical service, and all other specialties in the public health field will receive consideration. No limitations as to age, sex or residence have been fixed, though only those who are nationals of the countries in the American Public Health Association—at present, United States, Canada, Cuba and Mexico—are eligible.

The committee of the Association which has this matter in charge is composed of:

Homer N. Calver
Charles V. Chapin, M.D.
Lee K. Frankel, Ph.D.
Professor E. O. Jordan
George W. McCoy, M.D.
M. P. Ravenel, M.D.
M. J. Rosenau, M.D.
Robert Spurr Weston

The committee will not consider direct applications from candidates, but asks for nominations, giving the information suggested in the accompanying form. Nominations should be addressed to the Secretary, Homer N. Calver, 370 Seventh Avenue, New York, N. Y., and should include the following:

Name of the proposed candidate
Residence address
Business address
Age
Country of which the candidate is a citizen
Degrees held, date received and institutions from which received
Principal public health positions held
A brief description of the service performed because of which the candidate is recommended for consideration. This should include information as to when and where the work was done, the name of the organization or institution, if any, under whose auspices or in whose service the candidate worked, an estimation of the direct or indirect effect of the work measured in terms of life-saving or benefit to humanity. Publications, or similar data, published or unpublished, will be helpful to the committee. To be considered, the service must have been actually performed and not be merely a plan or suggestion.

Anonymous recommendations will not be considered; and the committee reserves the right to refrain from making awards in any year.

PENNSYLVANIA PUBLIC HEALTH ASSOCIATION

At the Annual Meeting of the Pennsylvania Public Health Association, held at Altoona, Pa., the following officers were elected: *President,* J. T. Butz, M.D.; *Vice President,* C. B. Maits, M.D.; *Secretary-Treasurer,* W. C. Miller, M.D.; *Assistant Treasurer,* Edgar S. Everhart, M.D. The Executive Committee consists of T. B. Appel, M.D., T. W. Henderson, A. M. Dewels, T. M. McMillan, M.D., Mrs. Lois Owen and H. C. Froutz, M.D.

MISSOURI PUBLIC HEALTH ASSOCIATION

At the Fifth Annual Meeting of the Missouri Public Health Association, held in Jefferson City, May 22–24, 1929,

the following officers were elected for the year 1929: *President*, Dr. L. Mason Lyons; *1st Vice President*, Ora Ann Carl, R.N.; *2d Vice President*, A. J. Drake, M.D.; *Secretary*, R. L. Laybourn; *Treasurer*, J. Frank Field.

NEW MEMBERS

Florence Bahn, Brooklyn, N. Y., Supervisor of Health Education, New York City Schools

Mary B. Baird, M.D., Evanston, Ill., School Physician

Eleanor Barnes, A.B., Worcester, Mass., Financial Agent, The Central New England Sanatorium and Industrial Colony, Rutland, Mass. (Assoc.)

Charles R. Blunt, Trenton, N. J., Commissioner of Labor, Department of Labor

Ethel G. Brooks, R.N., Wheeling, W. Va., Supervisor, Red Cross Public Health Nursing Service

Edwin Cameron, M.D., C.M., Beattyville, Ky., County Health Officer

A. J. Cohen, M.D., Philadelphia, Pa., Chief, Tuberculosis Division of the Department of Health

Calvin L. Cooper, M.D., Kansas City, Mo., Director of Public Health

J. W. Costello, Los Angeles, Calif. (Assoc.)

Joseph P. Kane, M.D., C.P.H., New York, N. Y., Field Director, Chautauqua Health Program

William T. Knoop, M.D., Edgewood, R. I., School Physician, Cranston, R. I.

William B. Kohn, V.M.D., Atlantic City, N. J. (Assoc.)

Edna Lewis, R.N., Tulsa, Okla., Director, Health Education, Jackson County, Mo.

William J. Lewis, Oil City, Pa., Health Officer and Milk Inspector

L. Mason Lyons, M.D., Kansas City, Mo., City Epidemiologist

Max J. Mackler, Ph.C., Ph.D., Tampa, Fla., Assistant City Health Officer

James S. McLester, M.D., Birmingham, Ala., Medical Director in Public Schools

Percy F. Murray, Peabody, Mass., Agent of Board of Health

Lillian I. Nichols, R.N., Saginaw, Mich., in charge of tuberculosis work

Terigi R. Paganelli, M.D., New York, N. Y., Eye Surgeon, Board of Education

George F. Pardee, C.E., Saugatuck, Mich., Sanitary Engineer

Ella M. Reynolds, R.N., St. Joseph, Mo., Buchanan County Health Nurse

William H. Robin, M.D., New Orleans, La., Superintendent of Public Health

Charles M. Sprague, A.B., Stanford University, Calif. (Assoc.)

John A. Stevens, M.D., Aliquippa, Pa., Beaver County Medical Director

Olga O. Teincuff, R.N., University City, Mo., Chief Nurse, St. Louis County Health Department

Robert B. Van Horn, C.E., Seattle, Wash., Assistant Professor of Civil Engineering, University of Washington

John H. Watkins, New Haven, Conn., Assistant Health Officer

DECEASED MEMBERS

R. S. Cooley, M.D., Cleveland, O., Elected Member 1924

M. R. Donovan, M.D., Lynn, Mass., Elected Member 1919

John B. Mitchell, Chevy Chase, Md., Elected Member 1923

Samuel H. Gilliland, M.D., Marietta, Pa., Elected Member 1900, Fellow 1922

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D.P.H.

Relationship with Private Physician—The ever present question of the need of closer coöperation between the practitioner of medicine and the organized health agency is strikingly referred to in a letter by Ernst P. Boas, M.D., recently published in the *Bulletin of the Bronx County Medical Society* and reproduced in the *Weekly Bulletin* of the New York City Health Department for April 13, 1929:

> Modern trends in medical practice will continue, for although they may work harm to the physician's pocketbook, by and large they benefit the public. The physician has no proprietary rights in his patients. In his capacity as a private practitioner he has no vested monopoly in all that pertains to the health and well-being of society. Just so long as his attitude is disinterested and guided by the needs of the many rather than of himself alone; just so long as he cultivates the acquisition, increase, and practice of medical knowledge, and regards his financial reward as a by-product rather than an end in itself; he will be honored in the community, and his counsel will be respected and followed. When he becomes primarily a tradesman, he properly loses caste and influence.
>
> It is true that the increasing socialism of medicine has led to and has perpetuated a number of injustices. The physician is still expected to give a large part of his time and services to the public welfare without compensation, or with inadequate compensation. It would, to my mind, be perfectly proper for physicians to demand payment for their work in hospitals and clinics. Such work is an assumption by one class—the physicians—of obligations that properly rest upon the whole community. Propaganda and action to achieve this end may be dignified and legitimate. It will certainly be more fruitful than these blind and furious onslaughts against measures for public health or public relief that are of proven value.
>
> But in every approach to these intricate problems that involve the relationship of the physician to the community, let us remember that we are members of the profession with a noble tradition, and that in dealing with human lives there is no place for the customs and practices of unscrupulous tradesmen.
>
> And it is our county societies, the building stones of our state and national societies, pledged to an honorable code of ethics, who should primarily keep alive the idealism, integrity and selflessness of the profession of medicine.

Does Vaccination Protect Dogs against Rabies?—There has been so much controversy as to whether or not the single injection method of vaccination protects dogs against rabies that it seems wise to publish each bit of information that may help in deciding the question. Detroit has been carrying on the single injection method of vaccinating against rabies since 1924, but 1928 is the only year in which records have been sufficiently accurate to permit of a comprehensive study. The detailed results of this study have been published in the May number of *City Health* (the monthly publication of the Detroit Department of Health).

During 1928 there were 5,799 persons reported bitten by animals in the City of Detroit. It was possible to obtain accurate information by personal investigation on 2,783 dogs which had bitten people. Of this number, 581 dogs were vaccinated and 2,202 were not vaccinated. Among the 581 vaccinated dogs, there were 3 with rabies, which gives a rabies incidence of 0.52 per cent. Among the 2,202 dogs which were not vaccinated, there were 131 rabid dogs, a rabies incidence of 5.94 per cent. According to these figures, which, it must be remembered, are based on the selected

group investigated by this department, the chances of developing rabies from a dog bite are 11.4 times as great if the dog has never been vaccinated as they would be if the dog had been vaccinated.

To test the accuracy of these figures, the problem was approached from a different angle. In 1928 there were 52,263 licensed dogs. Among the dogs of which we have definite knowledge, 41.4 per cent were vaccinated. Applying this percentage to the city as a whole we find that Detroit's dog population in 1928 was 126,239. This is obviously an estimate, and too much reliance cannot be placed in it. It is believed, however, that it is a reasonable approximation. There were, in 1928, 28,000 dogs vaccinated against rabies; the remaining 98,239 were not vaccinated. Among the vaccinated dogs, there were 10 cases of rabies, an incidence of 0.36 cases per 1,000 vaccinated dogs. In the 98,239 unvaccinated dogs, there were 441 cases of rabies, an incidence of 4.49 cases per 1,000 unvaccinated dogs. From these figures, we may conclude that an unvaccinated dog is 12.5 times more likely to contract rabies than a vaccinated animal. This figure is quite comparable with that of 11.4 which prevailed among those dogs for which definite information was obtained.

While the contention that the single injection method does not protect against certain types of street virus is very likely justified, the contention that it is worthless is not true. We must admit that, as is the case with most prophylactic measures, the protection afforded is relative rather than absolute, but the fact that a vaccinated dog is approximately 12 times less likely to contract rabies than a dog which is not vaccinated seems sufficient evidence to commend its use.

If we figure the rabies death rate among dogs as if it were a human rate, we find that it is 358 per 100,000 dogs. For the unvaccinated dogs, the rate is 449, while for the vaccinated dogs it is only 35.7. It is of interest to compare these with the human death rates from certain specific causes for the same year. In 1928 the diphtheria rate per 100,000 population was 16.3; the scarlet fever rate was 4.7; the tuberculosis rate was 94.8; the typhoid fever rate was 1.0; the measles rate was 11.8 and the whooping cough rate was 6.2. The combined death rate of all these causes was 134.8.

To those interested in the conservation of dog life alone, these figures should have a dramatic appeal. The comparison with the rates for human diseases shows in a startling manner the seriousness of the situation from the canine point of view. The death rate from rabies among dogs is nearly 3 times that for all the common communicable diseases for humans put together. The lesson to be learned from a comparison of the vaccinated with the unvaccinated is obvious.—George B. Darling, Jr., Assistant Epidemiologist, Detroit Dept. of Health.

Rural Health Administration in Iowa—Word has been received from Henry Albert, M.D., State Commissioner of Health, to the effect that the Legislature has transferred the State Epidemiological Service from the University of Iowa to the State Department of Health. The tuberculosis appropriation has been transferred from the State Board of Control to the State Department of Health. The Legislature has also made provision in the State Health Department for a law enforcement division, and has added another full-time and 2 part-time engineers for special service in connection with cities, tourists' camps, highway water supplies, etc.

The most outstanding act of the Legislature, however, in the field of public health was the passage of a county health bill which permits county supervisors to organize county health units

under the direction of a board of health, to consist of not more than 11 members, 3 of whom shall be members of the local county medical society, and others, who may include representatives of local boards of health of incorporated cities or towns situated within the county, to be appointed by the county supervisors.

LABORATORY

C. C. YOUNG

SIMPLE TEST FOR DELAYED ALUM FLOC IN FILTERED WATER

FRANK E. HALE, PH. D.

Department of Water Supply, New York, N. Y.

WATERS high in color, particularly when the color lacks age, frequently show incomplete flocculation of alum previous to filtration. Aggravation of this difficulty is caused by lack of sufficiently long storage after addition of the chemicals and also by the cold temperatures of winter. This condition is sometimes indicated by alum floc gathering in the bottom of a bottle of filtered water which has been allowed to stand for 24 hours in the warm laboratory; but even when no floc appears in this case, flocculation is frequently induced by passage through the fine sand (60–120 mesh) used for concentrating a sample for microscopic examination. It then appears as amorphous matter in the Sedgwick-Rafter cell and may be so roughly estimated quantitatively. To facilitate its recognition it is best to leave a fair sized air-bubble and rotate this around the cell several times. This gathers the floc into large masses of rather characteristic appearance. To distinguish the floc further from ordinary amorphous matter just sufficient "Alizarin S" (the reagent is a 0.1 per cent filtered solution of commercial alizarin S, the sodium salt of alizarin monosulphonic acid) is added to give a slight color to the liquid. The air-bubble is then rotated when the floc will gather all the dye and leave the liquid colorless. Ordinary amorphous matter will not take up the dye in this fashion. The method also serves to distinguish delayed alum floc from aluminum in clay which is included in any chemical quantitative method. It would thus be useful in examination of distribution system samples for delayed alum floc.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Maternal Mortality—During the year 1928 there were 5,001 patients in the obstetrical service of the New York Lying-In Hospital. Of these, 3,825 were in the wards, and 1,176 were in the outdoor department. In 1927, there were 4,871 patients, 3,648 of whom were in the wards, and 1,223 in the outdoor department. During 1928 there were 25 deaths, 1 of which occurred in the outdoor service. Eighteen patients were regular applicants who had been under hospital observation, and 7 were emergency cases first seen at the time of their entrance into the hospital. Four of the fatal cases had Caesarean operations performed. There were 3 low forceps cases, all regular applicants. The causes of death among these were: pneumonia, postpartum hemorrhage and peritonitis. There were 2 emergency breech cases and 10 spontaneous deliveries. In 3 of the spontaneous deliveries the cause of death was pneumonia, in 2 peritonitis, and in 2 endocarditis.—Meyer Rosensohn. Maternal Mortality for the Year 1928 at the New York Lying-In Hospital. *M. J. & Record*, 129: 517–518 (May 1), 1929.

The Incidence of Heart Disease in School Children—A survey was made of 10,333 children in 10 public schools of Philadelphia in order to determine the incidence of organic heart disease. The average percentage of heart disease in the children of all ages was 0.91. Of 5,052 children examined in the elementary schools 0.69 per cent had heart disease, as compared with 1.11 per cent of 5,281 examined in the high schools. Of the 76 cases found in the elementary and junior high schools, 0.78 per cent were among boys, as against 1.0 per cent among girls. Thirty-nine of 94 cardiac patients had chronic valvular disease with mitral stenosis, 14 had chronic valvular disease, mitral stenosis and mitral insufficiency, and 21 had hypertrophy of the heart, chronic valvular disease and probably mitral insufficiency. The physiologic diagnosis in 85 of the cases was regular sinus rhythm. Eight cases showed mild or marked sinus arrhythmia. Thirty of the 94 cardiac cases were able to carry on ordinary physical activity without discomfort; 63 cases were unable to carry on ordinary physical activity without discomfort; and 1 case showed aggravation of symptoms even when at rest.

It is suggested that periodic school health examinations would diminish the morbidity of heart disease, by revealing cases for treatment which would otherwise be unrecognized.—Jacob M. Cahan. *J. A. M. A.*, 92: 1576–1579 (May 11), 1929.

The Poliomyelitis Outbreak in Glasgow in 1928—The first recorded outbreak of poliomyelitis in Glasgow occurred in 1928. One hundred and twelve acute cases were reported. The outbreak was confined to the 4 months from July to October, during which period 91 cases occurred. Seventy-three per cent of the 112 cases occurred among children under 5 years. The disease fell most heavily on children between the ages of 1 and 2 years, 28 of the total 112 cases having occurred in this group. Infants under 1 year and children in the age group 4 to 5 were affected to a much lesser extent. The incidence among males was 58 per cent as compared with 42 per cent among females. The dis-

ease apparently showed no predilection for any social class. Fifty-six per cent of the cases showed symptoms of feverishness and malaise. In 6 per cent paralysis was apparently the first indication of illness. In 79 per cent of the cases paralysis appeared within 7 days of onset.

Paralysis was of the spinal type in 86 of the cases, and the lower limbs were principally affected. There were 8 deaths which occurred during the peak of the outbreak. In 4 cases death occurred on the third day from the onset of illness; in 3 cases on the fourth day; and in 1 case on the fifth day. At the end of January, 1929, an inquiry was made into the 86 cases of the spinal type. Four of these cases had moved from the city and 2 had died of intercurrent affections. Of the remaining 80 cases, 10 were still in the hospital, 41 were attending as out-patients, and 29 were home under medical supervision. Thirty of the 80 cases were still wearing splints or plaster, and the remaining were receiving massage, ultra-violet ray treatment, or no treatment. Forty-three per cent of the 80 cases were considered more or less completely recovered.—*Med. Off.*, 41: 155–160 (April 13), 1929.

Capetown Health Report, 1927—There is a population of over 200,000 inhabitants in Capetown, nearly half of whom are non-Europeans. The birth rate for Europeans has declined steadily, and in 1927 it was 21.4 per 1,000 population, the lowest yet recorded. The non-European birth rate was 50.3 per 1,000 population. The European death rate from all causes was 10.7 per 1,000 population, as compared with a rate of 28.0 for non-Europeans. The death rate for 1927 was somewhat higher than for the previous year on account of an increased mortality from respiratory diseases associated with an unusually cold winter.

The death rate from tuberculosis has shown no decrease during the past 10 years, and accounts for approximately 1 death in 7. Poverty and overcrowding are the principal causes contributing to this condition.—*Med. Off.*, 41: 165 (Apr. 20), 1929.

Tuberculosis in School Children—A study of tuberculosis among 25,048 school children was made during the 1926–1927 and 1927–1928 school sessions by the Extension Department of the North Carolina Sanatorium. The children were 15 years of age and under. Of the 25,048 children tested, 22.59 per cent showed a positive tuberculin reaction. There were 22,550 white children in the group, 22.07 per cent of whom gave positive reactions, as against 27.34 per cent of 2,498 colored children. Demonstrable tuberculosis was shown in 1.72 per cent of the total number tested, or 7.62 per cent of the positive reactors.

Among the white children 1.53 per cent of those tested had demonstrable tuberculosis, as against 3.21 per cent among the colored. Of the 431 children showing demonstrable tuberculosis, 388 were classified as tracheobronchial, 23 as pulmonary (parenchymal), 4 as tracheobronchial and parenchymal, 14 as extrapulmonary, and 2 as tracheobronchial and extrapulmonary. Six hundred and seventy-four or 2.69 per cent of the total number tested were classified as suspicious. This group included those who had either strongly suspicious symptoms without discoverable cause, or x-ray findings or both.

Suspicious symptoms with no other discoverable cause, and a positive tuberculin test, especially if it is a well marked reaction, justify a tentative or strongly probable diagnosis of juvenile tuberculosis, even though the x-ray is negative—P. P. McCain. A Report of the Study of 25,048 School Children for Tuberculosis. *South. M. J.*, 22: 310–319 (Apr.), 1929.

Japanese Birth Rate in California Declining—The number of Japanese births in California has declined gradually since 1921. In that year 5,275 Japanese births were recorded in the state, as compared with 2,833 in 1928. In 1919 Japanese births constituted 8.0 per cent of all births that occurred within the state, as compared with 3.4 per cent in 1928. In so far as the actual number of Japanese births is concerned, the total number for 1928 is about the same as it was for 1912. The checking of Japanese migration to this country is undoubtedly a factor in the production of the lower birth rate, and the aging of Japanese women who were of child-bearing ages 10 years ago may constitute another factor in the changed conditions.—*Calif. Dept. of Health. Weekly Bull.*, 8: 51 (May 4), 1929.

Health Conditions in Prussia—The decline in the birth rate has continued in Prussia. In 1927 the birth rate was 19.0 per 1,000 population, as compared with 20.3 in 1926. The birth rates for the first two quarters of 1928 were 19.1 and 18.1. There were 10 infant deaths per 100 living births in 1927. For the first quarter of 1928 the infant mortality rate was 10, and for the second quarter it was 9 per 100 live births. The mortality rate from all causes was 12.6 per 1,000 population in 1927, as compared with 12.3 in 1926. For the first quarter of 1928 the mortality rate was 13.4, and for the second quarter it was 12.0 per 1,000.

There were 2 cases of smallpox with no deaths in 1928, and 3 cases with 2 deaths in 1927. Typhoid fever showed a continued tendency to recede. There were 5,326 cases in 1928, as compared with 5,919 in 1927. Diphtheria caused 30,061 cases and 1,911 deaths in 1928, as compared with 24,384 cases and 1,974 deaths in 1927, and 20,336 cases and 1,543 deaths in 1926. Scarlet fever increased from 37,864 cases and 714 deaths in 1926 to 65,497 cases and 1,030 deaths in 1927, and 85,393 cases and 874 deaths in 1928. There was a tuberculosis death rate of 9.6 per 10,000 population in 1927, as compared with a rate of 10.0 in 1926.—*J. A. M. A.*, 92: 1616–1617 (May 11), 1929.

Malaria in the Panama Canal Zone—The Health Officer of the Panama Canal announces that the malaria admission rate among the force employed there was 14.2 per 1,000 for 1928, as compared with 10.7 in 1927 and 14.1 in 1926. The average rate for the last 3 years was 13 in a force having a mean strength of 13,517. The average admission rate for 1916–1925 inclusive was 19 per 1,000. No deaths from malaria have occurred in the Panama Canal force since 1920, except for 2 in 1924.—Four Years without a Malaria Death. *J. A. M. A.*, 92: 1610 (May 11), 1929.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

RESULTS OBTAINED IN PHENOLIC WASTE DISPOSAL UNDER THE OHIO RIVER BASIN INTERSTATE STREAM CONSERVATION AGREEMENT*

WILLIAM L. STEVENSON, FELLOW A. P. H. A.

Chief Engineer, Pennsylvania Department of Health, Harrisburg, Pa.

MR. Waring's paper ably sets forth the problem of phenolic waste water disposal from by-product coke ovens; and the splendid spirit of coöperation between that industry and state health departments, and between the health departments which are parties to the Ohio River Interstate Stream Conservation Agreement.

It is gratifying to the Pennsylvania Department of Health to note that the by-product coke oven installations of Pennsylvania on the Ohio River drainage basin have coöperated 100 per cent.

Mr. Waring, probably through modesty, has not told in detail what the companies operating coke ovens along the Mahoning River in Ohio have done for Pennsylvania at the instance of the Ohio Department of Health.

A few years ago Pennsylvania water works using the Beaver River as a source of supply were grievously afflicted with offensive tastes and odors apparently having their origin from the waters of the Mahoning River, which flows through the Youngstown district in Ohio. Today, it is only occasionally that these water works have any trouble, and credit is due to the Ohio companies and the Ohio Department of Health.

Exactly the same thing is true on the Monongahela River, which is used as a source of public water supply at many points in Pennsylvania. Here the abatement of the trouble is due to the coöperation of the company operating the by-product coke oven plant on the Monongahela drainage basin in West Virginia with the State Department of Health.

We feel in Pennsylvania that companies operating by-product coke ovens have done splendid work in expending large sums of money for construction and maintenance of works for the elimination or substantial treatment of their phenolic waste waters, and the problem, therefore, has become one of efficient operation of these works and notice of accidental spills.

Under date of July 9, 1928, all companies operating by-product coke ovens in Pennsylvania, except one, executed a formal agreement with the Sanitary Water Board for the purpose of coöperating for the protection of the public health through the safeguarding of public water supplies.

This agreement obligates the companies:

(a) To maintain, in an adequate state of efficiency, equipment and apparatus for elimination or treatment of waste water actually or potentially offensive in so far as any public water supply affected thereby is concerned.

(b) To sample and test the effluents from the various plant equipment and apparatus at sufficiently frequent intervals to detect the

* Discussion of paper by F. Holman Waring. See page 758 of this issue.

presence of such offensive materials that may occur through accident, corrosion of apparatus or other causes.

(c) To notify the Sanitary Water Board promptly of any accident to the plant equipment and apparatus which might impair the efficient elimination or treatment of the said waste waters.

(d) When accidents occur, to make expeditious repair of such plant equipment and apparatus, and, meanwhile, promptly adopt emergency remedial measures.

(e) To keep the Sanitary Water Board informed of new or improved methods that may be developed for the elimination or treatment of the said waste waters and to give the Sanitary Water Board full opportunity for determining to its satisfaction the efficacy of such methods.

The agreement obligates the Sanitary Water Board:

(a) Not to make public (excepting as provided in section (b) of this article) information received from the companies parties hereto, pursuant to Section 2(c) hereof, or to use or voluntarily furnish the same for purpose of prosecution, provided that immediate action be taken to make necessary repairs and the other provisions of this agreement be fulfilled.

(b) To give notice to water works in Pennsylvania likely to be affected by effluent from the plant where the said accident occurred in order that the operation of such water works may be modified, if practicable, in order to prevent or minimize offensive tastes or odors in the water supply as delivered to the consumers; and also to give notice to the health departments of down stream states in order that they may likewise give notice to their water works, provided, however, that in any notice given under this sub-section the name of the company at whose plant the accident occurred shall not be made public.

The agreement also provides that:

The bona fide installation and the efficient operation of means for the elimination or treatment of the said waste waters by parties of the second part in accordance with plans submitted to and approved by the Sanitary Water Board shall be deemed as compliance with the requirements of the law.

The Health Departments of Ohio, West Virginia, and Kentucky have formally agreed not to make public the name of the company in Pennsylvania where the accidental spill occurs when notice thereof is received from the Pennsylvania Department of Health, but to notify the water works which might be affected thereby of the possibility that their raw water may have offensive tastes and odors beginning on or about a certain date.

Under this Pennsylvania agreement, arrangements have been consummated with each company in Pennsylvania that it will immediately notify the appropriate district engineer of any accidental spills with necessary data concerning corrective measures taken; and a technic has been erected whereby, upon receipt of such notice, the district engineer will immediately notify all water works in Pennsylvania which might be affected thereby, and also, if it be on the Ohio River Basin, the chief engineers of the Health Departments of Ohio, West Virginia and Kentucky.

Pennsylvania was entirely satisfied with conditions in Pennsylvania on the Ohio River Basin at the important conference held in Pittsburgh in 1924, referred to in Mr. Waring's paper, but now that the Pennsylvania Companies have executed this agreement and set up the arrangement whereby water works may be warned in case of accidents, which obviously cannot be entirely prevented, we feel that the problem of protecting water supplies from wastes from by-product coke ovens in Pennsylvania is completely solved through the splendid spirit of coöperation of these companies.

Echoing Mr. Waring's closing remarks, we feel in Pennsylvania that this demonstrates the entire lack of need of federal legislation bearing upon wastes from by-product coke ovens, because of the interstate nature of the streams involved, and further that the solving of problems of this nature over the conference table rather than in the legislative halls and courts is the practical and successful method.

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THIS very complete paper by Mr. Waring summarizes in an admirable manner the complex problems which have arisen in recent years, due to the growth of the by-product coke oven industry and the universal chlorination of public water supplies, with special reference to the conditions in the Ohio River Basin. The results achieved through conferences between state and industrial authorities indicate what may be accomplished in prevention of the pollution of streams and the improvement in the quality of public water supplies through coöperation, rather than through the arbitrary enforcement of drastic legislation.

Results similar to those in the Ohio River Basin have been obtained in New York State through coöperation with industry where 5 out of 7 by-product coke plants, whose wastes have directly or indirectly affected public water supplies, have completed works for the elimination or recovery of phenol. In only one case has it been necessary to notify the coke plant to care for its wastes and this plant is now carrying on studies to determine the most economical method of treating the wastes compatible with local conditions.

The pollution of public water supplies by phenolic wastes was first brought to the attention of the State Department of Health in 1921, when a village in the central part of the state complained of very objectionable tastes and odors in its public water supply derived from a surface stream and filtered and chlorinated before being delivered to the consumers. About the same time it was learned that the entire season's pack of a pea cannery, which used this public water supply in the process of canning, had been spoiled due to objectionable tastes and odors in the peas.

Investigations of the complaint indicated that the trouble was due to the discharge of wastes from a by-product coke plant which had just been put in operation a few miles above the public water supply intake. Various methods of eliminating the wastes were tried by the coke company with indifferent success, until finally a well 297 feet deep was drilled in limestone formation, into which the ammonia still liquor, amounting to about 90,000 gallons per day, was discharged after passing it through a sedimentation tank and coke strainer to remove lime and other suspended solids in the wastes. This well has operated now for over four years without a material reduction in its capacity, and, so far as is known, this practice has not resulted in the pollution of any ground or surface water supplies, nor have any chloro-phenol tastes occurred in the public water supply below the plant.

At another by-product coke plant in New York State, the ammonia still wastes are coagulated with copperas, settled in a pressure sedimentation tank; filtered through pressure, rapid sand filters; and then discharged into two wells drilled to a depth of about 250 feet. These wells penetrate fresh water bearing stratums which were sealed off, and then penetrate a salt water bearing stratum into which the filtered wastes were discharged. The effective preliminary treatment provided was considered necessary to prevent the clogging of the water bearing stratum.

Two by-product coke plants referred to in Mr. Waring's paper, located at Buffalo and Troy, N. Y., recover phenol from ammonia liquors by means of benzol scrubbers, and discharge the effluent into surface water streams under permits issued by the State Commissioner of Health. One plant recovers from 80 to

90 per cent and the other about 95 per cent of the phenol in the ammonia liquors. In the former case the dilution available is over 200 times as great as in the latter. These plants have been effective in removing deleterious amounts of phenol in the raw water supplies, although even now in the winter months chloro-phenol tastes are occasionally produced in one of the water supplies below the plant. This is due presumably to the fact that the body of water receiving the residual phenolic wastes is cold during the winter so that the biochemical action which leads to modification of the phenols is greatly retarded.

One by-product coke plant in this state discharges the ammonia still liquors into a municipal sewer system and sewage disposal plant consisting of Imhoff tanks. This method of disposal, which, of course, is a very economical one for the gas works, was permitted by the city only after extensive studies and experiments had shown that the discharge of ammonia still liquor into the Imhoff tanks in the proportion of 20,000 gallons of wastes to 20,000,000 gallons of sewage had no deleterious effect on the sludge or on the operation of the Imhoff tanks.

Although these tests and experiments failed to indicate that the contact of the wastes with the sewage produced any appreciable reduction in the phenol content of the wastes, the outlet of the disposal works is more distant from the water supply intake and the dilution greater than the original point of discharge of the wastes, so that the local water supply problem has been solved. While these studies were being made, the water company whose filtered and chlorinated water supply was affected instituted the permanganate treatment of the water, similar to that originated by Sir Alexander Houston of London, England. This treatment proved to be very successful in eliminating chlorophenol tastes in the water. Similar treatment has been inaugurated at another water supply derived from waters occasionally affected by by-product coke wastes.

We have received splendid coöperation from the coke plants in this state and it is hoped that this spirit of cooperation now prevailing throughout the country will be continued in the study of this complex problem, in order that more may be learned as to the best method of disposing of phenolic wastes, and eliminating this serious source of pollution to our public water supplies.

ELLIS S. TISDALE

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MR. Waring has made a clear, concise and complete statement which sets forth the origin of the phenol wastes and chloro-phenol taste menace to public water supplies in the Ohio River Basin, its intensification with the growth and development of the by-product coke industry, and its successful checking by the application of a new and unique principle—the working together of states carrying out a joint policy in cooperation with industry.

One of the clearest pictures of the way in which this movement has grown can be obtained by a brief consideration of the events happening at the by-product coke plant of the Domestic Coke Corporation at Fairmont, W. Va. Here in 1925, after the Interstate Stream Conservation Agreement had been entered into between the states of Ohio, Pennsylvania, and Vest Virginia and joint similar policies set up in each state, this company made an attempt to quench,

but owing to the fact that all the coke went into the domestic market the quench method had to be abandoned due to staining and odor bearing qualities of coke so treated.

Research was immediately stimulated, for the phenol had to be removed if the company was to comply with the joint state policy. Mr. Gericke had his assistant chemists, Sweeney and Jones, make careful studies of the plants at Troy, N. Y., and Lorain, O., and set about building a similar plant, operating on the benzol absorption principle; but with refinements which would raise the plant efficiency on phenol recovery. This they were successful in doing by providing for greatly increased contact by means of beds of coke between the carrier—benzol—and the counterflowing NH_3 liquor which contained the phenol.

The phenol recovery plant at Fairmont which started operation January 1, 1928, built at a cost of $25,000 per 1,000 tons of coke, the daily plant capacity, has been operating throughout these ten months at 96–98 per cent efficiency of phenol recovery and is highly satisfactory to the company in its performance.

When Sanitary Engineers Gorman, of Chicago, and Waring and Hatch, of Ohio, visited this plant in January, 1928, following the bad taste epidemic in the Chicago water supply, it was the most complete and successful phenol treatment recovery plant in operation, and it established a principle, profitable recovery, which has led to rapid changes in existing by-product plants and bids fair to revolutionize the old wasteful quench method of phenol wastes disposal.

The fact that three states in 1924 set up and agreed to a fundamental policy for phenol wastes disposal, which they proposed to carry out by coöperation with industry, stimulated research to a remarkable degree. Not only did the Fairmont plant build a successful phenol recovery plant, but the recovery promised to meet operating charges and possibly fixed charges with a possibility of profit, when refinements were made. Also, the Koppers Company speeded up its experimental work along another line which has resulted in the new and successfully operating recovery plant at Hamilton, O., spoken of by Mr. Waring. This plant recovers more than 98 per cent of the phenol, according to the latest advices, and is simple, positive, and easy of operation. The two new phenol recovery plants at Ironton, O., and Ashland, Ky., which are to be operated on the "light-oil" absorption process, indicate the rapidity with which the program of phenol recovery has gone forward. The Ironton plant was started June 1, 1928.

West Virginia has recently, through joint conferences with the Ohio State Health Department and representatives of industry, provided for the completion of the program of phenol removal from the Ohio River from West Virginia coke plants where final action had not been taken, so that the summer of 1929 should see all phenol wastes out of the Ohio.

In connection with the question of tastes, it is of considerable interest to note that the 98 per cent of removal at Fairmont has eliminated tastes from the Morgantown water supply, and the public water supplies in Pennsylvania on this stream are no longer detrimentally affected by wastes from the Fairmont plant in West Virginia. Likewise the improvement in phenol wastes treatment at Midland, Pa., on the Ohio River above the West Virginia line, has markedly reduced the tastes in the Wheeling water supply. In 1927 bad tastes were recorded on 8 days by G. E. Richard, superintendent of this new filtration plant, and in 1928 only once were phenol tastes recorded. The 100 per cent success already achieved in Ohio in removing phenol wastes has likewise

been a big factor in the decrease in tastes at Wheeling and in other West Virginia Ohio River supplies this year. With the completion of two new phenol recovery plants on the watershed in West Virginia above Wheeling, chlorophenol tastes should become a matter of history.

Certain very definite advances in the public water supply field have been made since the Interstate Stream Conservation Agreement was adopted by Ohio, Pennsylvania and West Virginia in 1924:

1. By its complete success it has been demonstrated that a coöperative policy between states and with industry will work.

2. Carrying this program on the Ohio River Basin to a successful conclusion has been hastened greatly by the recent invention and improvements in phenol recovery processes, which work was stimulated by the coöperative state program.

3. It appears likely that practically all new by-product plants will install phenol recovery processes when the by-product plant is built, since at the present stage of development phenol recovery is on almost a self supporting basis and by-product plants now using the quench method will gradually revamp their works to recover phenol and save the very high depreciation losses involved in the quench method.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Heart Disease and Industry—Heart disease more than any other malady seriously affects the life of the industrial worker. Symptoms of organic heart disease are first complained of after exercise—breathlessness, particularly in the region of the heart, giddiness, fainting, exhaustion and palpitation. Those in heavy work complain first. Not more than half of the workers who break down before the age of 40 with heart symptoms, however, have organic heart disease.

Rheumatic infection is the chief cause of organic trouble, but general ill health likewise accounts for many cases of heart symptoms. Only a small portion with rheumatic heart disease live past the age of 40. After 40, syphilis leads to premature death from heart disease in a small number. Five-sixths of the total number of deaths from heart disease occur after age 40, and the principal cause is a degenerative process of senescent type. Hence, the importance of recognizing this condition early. A suitable occupation, healthy home conditions, and proper medical supervision can prolong the working life of these individuals.

A sanatorium form of treatment should lead to a considerable lowering of heart disease deaths, particularly those of the rheumatic type. Two special convalescent homes for boys and girls with heart disease have been established in London. The economic waste and financial strain on the insurance funds for this disease should cause the public to realize the benefits of convalescent homes, whose cost is comparatively infinitesimal.—Thomas J. Cotton, *J. State Med.*, 37, 2: 100–106 (Feb.), 1929.

The Effects of Labor Legislation on the Employment Opportunities of Women—(Abstract of Summary). With each decade women employees have increased among the gainfully employed. More significant is the great development in the kinds of work open

to them. They have likewise assumed a steadily increasing importance of positions. At the same time, labor legislation applying to women has shown extensive increases, although this is very uneven in the various states, so that not over one-third enjoy legislation limiting hours of work. Massachusetts and California in particular have set up laws governing minimum standards for women's employment. These laws are of two types—those that regulate, and those that prohibit. In the matter of regulations, many qualifications and exemptions are permitted; likewise, legislation is only effective where it is enforced. Hence, conclusions as to the effects of legislation must be drawn with great caution.—Women's Bureau, U. S. Dept. Labor, *Bull. No. 68*, 1928, 22 pp.

The Health of Women and Girls in Relation to Industry—Our intelligent girls from the industrial classes when they leave school usually become highly skilled workers, and when they marry they are far better off because they may continue at such work when, owing to industrial depressions, the husband is out of work. True, there is very little leisure in their lives. Their physical fitness should be vouched for after medical examination. Among practical tests, acuity of vision is specially important, since one encounters women who have passed through all of the standards of the elementary school, but who from disuse have lost the power to read.

Likewise, mental defects, middle ear disease, dysmenorrhea, and defects following childbirth are prominent and lamentable, the more so because so many may be corrected. The mother of a family who has not been damaged in childbirth is perfectly fit for hard physical work. During the War, the author recalls three cases of direct inguinal hernia, as the result of work on lathes; no woman developed an indirect inguinal or femoral hernia; no woman with an intact pelvic floor developed any uterine displacement; and no woman developed cardiac incompetency where the heart was sound on engagement. Work in no way conduced to sterility, but even appeared to render some more fertile. The rate of purposeful abortions was proportional to the rate pregnant women were discharged. When the women were permitted to continue work which was suitable to them, no abortions followed, and they came to term with excellent results, both to themselves and to their children.

The author's practice has failed to find defects in women attributable to hard work, during the war or afterward. The principal point is, physical fitness of women for work, and not that women should not work. "There is no inherent incapacity for hard work in women as a sex, and public opinion and legislation" should be changed in this respect.—Mrs. R. H. B. Adamson, *J. State Med.*, 37, 2: 107–113 (Feb.), 1929.

Women Workers in Flint, Mich.—This bulletin summarizes various conditions of the employment of women, including hours, earnings, working conditions and personal history. The median of the week's earnings was $16.50, and of the year (for 132 women) $775. The usual work day was 8½ to 9 hours, with a short day on Saturday, except in stores. More attention was given to lighting than to ventilation; and particularly, the effect of too much heat and steam did not receive sufficient attention. Inadequate seating was often present. It was found that 31 of the 34 establishments had insanitary drinking "bubblers," and 21 plants were using the common drinking cup. The common towel was found in 56 establishments, and no towels in 24. Toilet facilities were sometimes inadequate. (The bulletin should be consulted by

those interested further.)—Women's Bureau, U. S. Dept. Labor, *Bull. No. 67*, 1929, 79 pp.

Child Labor—This bulletin contains a series of six articles prepared respectively by William John Cooper, U. S. Commissioner of Education; Hugh Grant Rowell, M.D., Teachers College, Columbia University; Olive A. Cooper, M.D., Massachusetts State Department of Mental Hygiene; Weaver Pangburn, Playground and Recreation Association of America; Sidonie M. Gruenberg, Director of the Child Study Association of America; and William Green, President, American Federation of Labor. (Space does not permit more than this mention.)—National Child Labor Committee, 215 Fourth Avenue, New York, N. Y., *Pub. No. 352*, May, 1929, 39 pp.

Trends in Personnel Health Service—This bulletin discusses in Part I the agencies interested in the promotion of organized health and sanitation activities, both prior to and since 1910. Part II takes up industrial groups, including the activities of various industrial associations, many leading companies and corporations of the United States, as well as the efforts of organized labor and joint boards of sanitary control. Among associations, societies and institutions, the names and dates of organization are given for 24. Under "public agencies" are listed the principal medical schools, federal and state departments, bureaus and agencies. Legislation has been concerned principally with reporting, prohibition, regulation and compensation or insurance.

The article ends with a brief summary of the principal literature, and the statement that prior to 1880 the *Index Catalogue* of the Surgeon General's Library shows there were but 5 books, and 75 articles relating to industrial hygiene or occupational diseases by American authors. During the period 1880–1900, American authors made but 22 contributions. From 1900, and more especially from 1908, such contributions increased to the extent that by June 30, 1921, 702 subjects had been indexed in the Library of the Surgeon General's Office.—W. H. Lange, American Management Association, 20 Vesey Street, New York, N. Y., *General Management Series: No. 85*, 1929, 48 pp.

Reporting of Occupational and Industrial Diseases—The first essential in preventive medicine is to know where, and in what numbers, diseases occur; hence, an active law requiring that all physicians report certain well-known and definite diseases to one central department of government having jurisdiction in matters of public health. The next feature is the matter of what to do about such afflictions as occupational diseases and accidents. The problem is how to apply preventive medicine to this situation. However, the result of the lack of coöperation of the physicians has not brought about the ends desired. In the past 4 years, less than 10 physicians, and not more than 5 hospitals (in New York State) have reported occupational diseases. Industrial hygiene is one of the most important subjects of public health, as it deals with nearly one-half of the adult population.

Greatly increased coöperation on the part of the medical profession is necessary, and among the first essentials is the reporting of occupational diseases.—Robert S. McBirney, New York State Bureau of Industrial Hygiene, *Indust. Hyg. Bull.*, 5, 11: 40–44 (May), 1929.

Inadequacy of Present Provisions for Rock Dusting in Coal Mines—The U. S. Bureau of Mines reports in a recent circular (No. 6087) the results of a recent survey on rock dusting in coal mines. This survey disclosed the fact that rock dusting provisions are

woefully inadequate in the United States, and that but a small fraction of 1 per cent of coal mines is adequately protected by rock dust. During the fiscal year ending June 30, 1928, 22 explosions in bituminous mines were reported to the U. S. Bureau of Mines, with 320 fatalities. Of this number, 10 mines with 258 deaths were supposed to have been using rock dust. Investigation, however, revealed the fact that the measures were inadequately enforced because of a lack of proper comprehension of their value. The cost of rock dusting is approximately 1 cent per ton of coal so that the element of cost should not be a bar to its very widespread adoption. It is hoped that rock dusting of mines will increase rapidly in the near future.—U. S. Dept. Labor, *Month. Labor Rev.*, 28, 2: 240 (Feb.), 1929.

L. G.

Physiological Response Attending Exposure to Vapors of Methyl Bromide, Methyl Chloride, Ethyl Bromide and Ethyl Chloride—The authors discuss the apparatus and test procedures and results of investigations upon the substances named in the title, some of which are used in refrigeration. A table on page 31 summarizes the physiological response to various concentrations of some 17 common gases and vapors.—R. R. Sayers, W. P. Yant, B. G. H. Thomas and L. B. Berger, *Pub. Health Bull. 185*, 1929, 56 pp.

Quarry Accidents in the United States in 1926—According to the recently published report of the U. S. Bureau of Mines, there was an increase from 1.78 in 1925 to 1.87 in 1926 in the fatality rate per 1,000 300-day workers, and a decrease from 169.67 to 160.28 in the injury rate. Measured by the fatality rate, the accident hazard appears to be greatest in granite quarrying (3.52); next in marble quarrying (3.12). The injury rate was highest in trap rock, being 244.92; limestone being next with a rate of 207.39. The cause of fatal accidents in order of importance was as follows: falls or slides of rock or overburden, explosions, haulage, machinery, electricity, falls of persons and burns. Most of the non-fatal injuries were caused by flying objects, handling rock, machinery, haulage, falling objects, falls of persons, hand tools and falls or slides of rock or overburden.—U. S. Dept. Labor, *Month. Labor Rev.*, 28, 2: 239 (Feb.), 1929.

L. G.

Occupational Dermatitis—The Bureau of Women in Industry of the New York State Department of Labor has recently completed a study of 390 cases of dermatitis of industrial origin. It was found that 24 per cent were of over 1 year's duration, 21 per cent lasted from 1 to 3 months, and 16 per cent from 4 to 6 months. Ninety-one of the cases began on the hands and spread to other portions of the body. Thirty cases were primary and in other locations, chiefly the legs. Dermatitis on the face appeared to be chiefly a result of carrying irritating substances to the face by the hands of the worker. The largest percentage of cases was caused by soap and soap cleansers. The next largest group was due to dyes and lime. Other causes were lead, ink, flour, sugar, chromic acid, methylene alcohol, etc. One hundred and eighteen cases were associated with house work; included among these were porters, janitors, restaurant workers and building cleaners. The constant handling of carbon paper was a source of dermatitis among stenographers.—U. S. Dept. Labor, *Month. Labor Rev.*, 28, 4: 782 (Apr.), 1929.

L. G.

Industrial Accidents in Massachusetts, 1926–1927—The Department of Industrial Accidents of the State of Massachusetts has recently issued the report of the industrial statistics for the 15th year (ending June 30, 1927). The

report indicates a decided increase in the number of accidents over the previous year, and also an increase in the number of tabulatable injuries, the latter being increased from 36.7 to 38.3. The most frequent cause of death was associated with vehicles, the next in order being falls of persons. The most frequent cause of permanent disability was machinery, the second most important cause being handling objects. The most frequent cause of temporary disability was handling objects, falls being the second most important cause.—U. S. Dept. Labor, *Month. Labor Rev.*, 28, 2: 242 (Feb.), 1929. L. G.

Spray Painting Practices and Hazards—This is a report of an investigation of spray painting methods and hazards in 71 manufacturing and mercantile establishments and 8 government posts, to determine (1) what has been done to overcome the hazards of the process, and (2) what can be done further to protect the worker or eliminate the inherent dangers of the method.

Experience with the use of the spray apparatus in the various plants ranged from 2 months to 20 years. Investigations showed that 36 plants had 1 case each of poisoning; 6 establishments had 2 cases, 2 establishments 3 cases, 2 establishments 5 cases, and 1 plant 6 cases of illness. Twenty-four plants reported no trouble of any kind. Six of the cases resulted in death, while in the remaining a disability up to 1 year's duration was the chief outcome. Most of the cases reported were lead poisoning. There were several cases of lacquer poisoning, 2 cases of benzol poisoning, and 1 case of turpentine poisoning.

Among substitutes for toxic materials titanium oxide is especially recommended in place of lead, and iron oxide in some instances. Experiments conducted by the U. S. Navy indicate that lead can be eliminated entirely by such substitutes which are found to be equal to lead in all qualities studied. Toluol, xylol and similar materials may be substituted for benzol.

It was found that family physicians were treating these cases for ailments based on the outstanding symptoms under such diagnoses as: stomach trouble, appendicitis, etc. Small plants were, as a rule, the more dangerous places. In a few large plants employing as many as 200 to 300 spray operators there have been only one or two slight cases of disability in the course of several years' experience.

In addition to adequate ventilation provisions, additional protection, it is pointed out, may be secured by the enforcement of high standards of personal hygiene, instruction in the proper use of the spray gun, the use of wet sand papering methods in place of dry methods, the use of as low pressure spraying as is consistent with satisfactory output, and the use of non-toxic materials in so far as possible.—U. S. Dept. Labor, *Month. Labor Rev.*, 28, 5: 915 (May), 1929. L. G. & E. R. H.

Electrical Accident Prevention—This circular discusses the prevention of electrical shock, the safeguarding of machinery and apparatus, both upon the surface and underground; the prevention of gas ignition and explosions; the suggestions for improvement; and mine-fire prevention.—L. C. Ilsley, U. S. Bu. Mines, *Circular No. 6100*, Feb., 1928, 8 pp.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Experimental Hypervitaminosis—In order to determine the effects of massive doses of vitamin D, 24 white rats, 3 weeks old, weighing 50 to 60 gm., were placed in 3 different cages and kept in the dark on a rachitic diet No. 3143 of McCollum and coworkers. In the first group, 8 control rats were placed on the vitamin diet; in the second group, 8 were on the same diet with the additional dose of 5 mg. of irradiated ergosterol (Vigantol) a day in ½ c.c. of 1 per cent solution of olive oil, and in the third group, 8 animals on the same diet with the addition of a dose of 3 drops of cod liver oil per day. Between 3 and 5 weeks all of the animals receiving the excessive dose of ergosterol died, this dose being about one thousand times higher than that used by Gyorgi and other investigators. Those in groups 1 and 3 at the end of the 5th week showed no deleterious effects. They kept their appetite and developed well.

A second experiment of overdosage gave the same results. Four rats receiving the excessive doses were taken from the cages and the dosage stopped. After that the result on health, appetite, development, and increase in weight was favorable, similar to the control rats. The remainder of the rats receiving the excessive ergosterol gave the same severe pathological changes, and death occurred within the 4th and 5th weeks.

The authors describe the symptoms of hypervitaminosis which they term "Vitaminismus." These are chiefly: general loss of weight of 30 per cent despite a relatively good appetite, arrested development, increased temperature, rough coats, and, in some cases, paralysis of the legs. The authors discuss 3 manifestations of so-called "Vitaminopathy": (1) through deficiency or hypovitaminosis; (2) through excess or hypervitaminosis; and (3) through lack of coördination between the different vitamins or dysvitaminosis. The importance of this knowledge is stressed in the application of vitamin supplements in the treatment of children's diseases and it is concluded that the results are as remarkable as the original discovery of vitamins. The dose of vitamin D administered was 5,000 to 50,000 greater than that ordinarily employed so that the difference between the necessary and the fatal dose is great and difficult to estimate in the case of man. —J. A. Collazo, P. Rubino, and B. Varela, *Biochem. Ztschr.*, 204: 347 (Jan.), 1929.

"Hypervitaminosis" and "Vitamin Balance"—Previous investigators have reported injurious effects of excessive doses of vitamin D, most of the work published relating to cod liver oil or its concentrates as the source of this vitamin, although in some of the recent work irradiated ergosterol was used. The present work was done on growing rats and the vitamin preparations were administered with the ration instead of separately. In one experiment young rats weighing 40 to 50 gm. each were given synthetic diets containing irradiated ergosterol in the concentrations 0.00001, 0.001, and 0.1 per cent, the controls being given the same dose of non-irradiated ergosterol and heated ergosterol, and some no ergosterol. In addition, each animal received 2 drops daily of cod liver oil and an alcoholic extract of marmite. All animals re-

ceiving 0.1 per cent of irradiated ergosterol lost weight and died after 20 days; those with smaller concentrations grew normally and appeared to thrive. No ill effects were observed on the controls receiving heated or non-irradiated ergosterol. The rats on the high concentrations suffered inanition, diarrhea, and developed lesions on the hind paws, as well as greasy and rough coats. Post-mortem appearance resembled vitamin B deprivation.

An experiment was conducted to see if the deleterious effects of the ergosterol could be offset by an increase of vitamin B (Complex). The marmite dose was increased to 4 times the normal level but with negative results. Two animals given fourfold marmite with added wheat germ extract and orange juice maintained weight and apparent good health while the controls with unsupplemented diets declined. Rats refused to eat synthetic diets containing 250 mg. of irradiated ergosterol while they readily ate those of the same amount of non-irradiated ergosterol.

In another experiment rats were offered synthetic diets containing (1) non-irradiated ergosterol, (2) irradiated ergosterol, and (3) no ergosterol. Non-irradiated ergosterol was eaten in preference to the irradiated. In animals deprived of vitamin B, growth stopped and death took place at about the same rate irrespective of the amount of vitamin D in the diet. Rats receiving a thousand times the necessary vitamin D succumbed to B-avitaminosis at the same rate as those receiving no vitamin D in the diet. Similar diets were fed two sets of rats with the exception that one received 15 per cent of the fat in potent cod liver oil and the other the same fat content in peanut oil. These sets were then placed on different allowances of standard marmite to note the effect of vitamin B intake. The cod liver oil rats grew slower than the ones on peanut oil. Differences were most marked in the intermediate marmite concentrations adequate for maintenance. Only small differences were observed at the highest and lowest marmite levels. In this experiment no litters were obtained from the cod liver oil group, but on the peanut oil group 7 litters were obtained, all from the rats receiving a maximum marmite extract in the diet.

Cod liver oil concentrate (unsaponified matter of cod liver oil) was administered to one of two groups of rats on standard diet without marmite addition. Both groups showed vitamin B deprivation, but the loss in weight was more rapid in the group receiving the concentrate. The condition in this group ultimately resembled pellagra.

The authors conclude that while the results indicate toxic properties attributed to vitamin D the question is complicated by the fact that vitamin D cannot be administered at the present time free from impurities and that the toxic substance might be attributed to accompanying impurities, and the further possibility that the excess vitamin D unbalances the vitamin B allowance.

Further experiments are in progress to determine the effects of ergosterol which has lost its vitamin D through over-irradiation and the effect of vitamin D upon calcium and phosphorus metabolism.

The authors caution against alarm in the use of commercial preparations since the doses shown to produce toxic effects were greatly in excess of those which would ordinarily be employed in practice.—Leslie Julius Harris and Thomas Moore, *Biochem. J.*, 22: 1461, 1928.

The Commercial Application of Lactobacillus Acidophilus Milk—This is a brief review of the literature on the therapeutic value of *L. acidophilus* in milk culture; the report of studies on the isolation of the organism from the feces of rats on high lactose diets, the

change in the intestinal flora of rats following feeding with *L. acidophilus* cultures, and the growth and viability of the organism under varying conditions; and a description of the commercial method of manufacturing acidophilus milk with general directions for its use. An extensive list of literature references is appended.—E. L. Reichart and H. P. Davis, *Nebraska Sta. Bul. 228*, 1928, p. 19. Abstract, *Exper. Sta. Rec.*, 60: 593 (Apr.), 1929.

Antineuritic and Water-soluble B Vitamins in Beef and Pork—Pigeons were used as experimental animals and the controls were fed a basal diet practically devoid of antineuritic vitamin B. In experiment No. 1, supplements of beef and pork were used. Five per cent fresh ham protected pigeons against polyneuritis for 70 days; 10 per cent fresh ham protected pigeons at the same time; and 20 per cent dried beef failed to protect against polyneuritis and loss of weight, but 40 per cent dried beef protected the birds for 70 days.

A second experiment was performed in which the rice in the basal ration was heated 1½ hours under pressure to destroy any antineuritic vitamin present, as against unheated rice for the first experiment. Pigeons on the basal ration developed polyneuritis earlier than in experiment No. 1. Neither 5 nor 7.5 per cent of dried baker's yeast prevented polyneuritis. Five per cent of dried brewer's yeast offered protection for at least 8 weeks but one bird developed the disease on the 40th day. Dried beef in the amounts of 12.8, 21.4, and 34.2 per cent was tried but the maximum was hardly sufficient as a protective, one pigeon in this lot developing polyneuritis. Five per cent of smoked ham protected all pigeons in this experiment against polyneuritis for 8 weeks. Albino rats were used in testing water-soluble B vitamins, the controls being fed the basal ration until gain in weight stopped. Three lots of fresh and two of dried ham in amounts varying from 10 to 24 per cent were fed and no material difference noted; good growth and gain in weight resulted when the percentage of ham was 15 or more. Dried fresh beef was tested for water-soluble B vitamins in 4 lots, 40 per cent supplement being insufficient for material growth. On 70 per cent supplement the rats grew rapidly. For comparison purposes it was found that dried brewer's yeast in 5 per cent supplement and baker's yeast in 7.5 per cent furnished sufficient water-soluble B for excellent growth.—Ralph Hoagland, *J. Agri. Res.*, 38: 431 (Apr. 15), 1929.

The Effect of Heat on the Antineuritic Vitamin of Milk—This investigation covers three types of dried milk: one, made by the spray process; a second, made by superheated rollers, and a third, a desiccated albumin milk. In addition, tests were made of commercially pasteurized and home pasteurized milk, and of milk quickly boiled. Various mixtures of these preparations were given to suckling rats whose mothers were on high protein ration. Tables are given showing the various supplements to the ration and the gain and loss in weight of the animals. The results indicate destruction of the antineuritic vitamin in all of the superheated milk except that made by the roller process. Similar results are apparent in the milk pasteurized by the open method, while that pasteurized by the closed method showed no vitamin destruction. Milk heated to boiling temperature quickly and cooled slowly is severely affected, while the same milk cooled quickly shows no adverse effect. The authors conclude that temperature and aeration are important factors in the destruction of the antineuritic vitamin. —Amy L. Daniels, Mate L. Giddings, and Dorothy Jordan, *J. Nutrition*, 1: 455 (May), 1929.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

The Nursing Division of the League of Red Cross Societies—At the time of the foundation of the Red Cross Societies at Geneva, in 1864, there was recognition of the value of nursing as an indispensable part of its activities, and recommendations were made from time to time relative to the type of person best fitted for nursing service. Ever since 1907, there have been peace-time programs in the Red Cross Associations for training nurses in the care of the sick either through short special courses, or the formation of training schools attached to hospitals, with the idea of preparing them for participation in any emergency such as war, epidemics, or floods, which might arise.

Since the World War, the conception of the nurse's function has broadened to conform to our larger viewpoint in regard to health work. At the medical conference in Cannes in 1919, it was recommended that a department of nursing, under the direction of a qualified nurse, should be organized as part of the League of Red Cross Societies. The purpose of this department was to assist the Red Cross Societies in their different countries, and to establish a postgraduate training center. Certain resolutions about the needs in regard to nursing service were drawn up at that time.

Soon there followed the formation of the Nursing Advisory Board, representing various nursing organizations from different countries, and the recommendations of this board, which were accepted by the Third General Conference of the League in 1924, were in line with the resolutions introduced in the earlier conferences. They were:

1. That the development of nursing should form a vital part of the program of each national Red Cross Society.

2. That societies should endeavor to stimulate the development of schools of nursing of the highest order in their respective countries provided that institutions of this character do not exist.

3. That, in future, national Red Cross Societies should designate as Red Cross nurses only those graduated from these schools of a high order, and that the group of women trained by Red Cross Societies for emergency purposes be designated by some such title as "Voluntary Aid Detachments," or "Sanitary Aids," and should serve under enrolled Red Cross nurses.

4. That national Red Cross Societies should promote the efficient education of public health nurses, whenever the Red Cross Society is engaged in health activities where public and private organizations look to the society for assistance in health work.

5. That national Red Cross Societies should endeavor to promote in the minds of the public in their respective countries the national importance of the nurse, and to work for the advancement of nursing education and the improvement of the social and economic status of the nurse.

6. That national Red Cross Societies should enroll in a nursing reserve all the qualified nurses in their countries who would be in a position to respond in time of war, disaster, or epidemic.

7. That each national Red Cross Society should appoint an advisory nursing committee of leading nurses and representatives of the medical profession, and of the health, educational and hospital authorities, to study the needs, determine the activities, and guide the development of any activities undertaken by the Red Cross.

Since then, the Advisory Board has been altered to a small Advisory Committee representing different racial groups, with an *ex officio* representative from the International Red Cross Committee, and a representative of the country in which the meeting is being held.

The two international courses for

postgraduate instructions, organized according to the original recommendations, have up to the present time received about 141 students from different countries. The schools are centered in London at Bedford College for Women, in conjunction with the College of Nursing; one being a course in public health, and the other a course for nurse administrators and teachers in schools of nursing. A permanent residence for the international students is maintained at 15 Manchester Square.

A further activity of the League in regard to nursing has been the loaning of fully trained nurses to countries having no training schools, for the purpose of starting schools according to the methods now accepted as standard in western countries. These schools have been undertaken with the idea that they were to be transferred to native graduate nurses as soon as possible for permanent development. Sometimes, where the need of certain countries has been for money to maintain schools rather than for nurses, this has been supplied through the League. There are now about 160 schools of nursing in different parts of the world, conducted by the Red Cross Societies. Public health nursing is being incorporated in the training as much as possible, and travelling scholarships have made foreign study possible.

Public health activities in maternal and infant welfare, tuberculosis, and school nursing, have made possible advances in sections of the world formerly untouched by health work. In disaster relief, the public health nurses have given their usual prompt and efficient aid.

In assistance to Red Cross Societies in their own countries, the activities of the Nursing Division may be described as follows:

Setting up a clearing house for information on nursing subjects, and collecting, compiling and distributing information on the development of nursing in different countries for the use of Red Cross Societies

Maintaining a package library on nursing and associated subjects

Continuing an advisory relation with students who, having completed the International Course, are at work in their own countries

Providing pictures, films, exhibits, pamphlets on nursing

Preparing or securing articles for *The World's Health*

Offering advisory service to national Red Cross Societies through correspondence, visits at League headquarters and visits to the individual Society

Promoting regional Red Cross Conferences for nurses.—

Elizabeth Gordon Fox, Out of an Idea Has Grown a Great Pioneer Service, *Red Cross Courier*, VIII, 9: 25 (May 1), 1929. K. E. P.

Grant for Dental Research—Nowadays, dentists send periodic gentle reminders urging that teeth need attention, so we take our courage in hand and go, realizing that if we preach prevention it is just as well to practice it. Before long, we may know the reasons underlying the need for prophylaxis. The Yale School of Medicine has effected a plan for intensive study of the teeth in relation to the body in general, and a grant from the Rockefeller Foundation has made the project possible.

A study group composed of physicians, surgeons, radiologists, bacteriologists, dentists and pathologists has been formed, with Milton C. Winternitz, M.D., Dean of the Yale School of Medicine, as chairman. Clinical investigations of the condition of the teeth and the bacteria to be found at their roots will be carried on in coöperation with fundamental research in the structure and function of the teeth in health and disease. The germs found at the roots will be isolated and studied in relation to germs found in the mouth and in other parts of the body, and their effect upon the organism. The purpose is not to interfere with training in dental technic as now practiced in schools of dentistry, but to create a group of medical specialists in teeth. Each year from 2 to 4 graduates of dental schools will be admitted to the School of Medicine to continue their medical studies and to work with the dental pathology study group.

How Is Your Blood Pressure?—What blood pressure is:

Circulation of the blood through the arteries, capillaries and veins takes place through the exertion of constant pressure of the blood stream against the elastic walls of the arteries.

This degree of pressure varies constantly, depending upon activity. The highest point of pressure is reached during the time when the pulse "beats" and is called the systolic pressure. The lowest point, the diastolic pressure, represents the degree of pressure existing between "beats." The variation in the levels to which these two points rise and fall is not great in the normal person. But a condition in which the degree of systolic and diastolic pressure remains at too high a level is an accompaniment and perhaps a contributing cause to many serious middle-age and old-age diseases. This condition is known as hypertension and is one which develops slowly, aided markedly by wrong habits of living. It is much easier to prevent than to cure.

How to avoid hypertension:

The prevention is mainly through the avoidance of physical or emotional excesses. The way you live and think now is going to have far more to do with your blood pressure 50 years from now than any amount of medicine you can take then.

A few good suggestions are:

1. Moderation in eating, smoking, drinking, exercising, and any activity which worries you or tires you out
2. Regularity in eating, sleeping, bathing and eliminating
3. Ruling fear and anxiety, especially about yourself, out of your life

For the older person with high blood pressure, a quiet life and a contented mind will do more than all the medicine in the world to reduce it to lower levels. Periodic consultations with the doctor are necessary for the maintenance of health.—Norman B. Cole, How Is Your Blood Pressure? *Hygeia*, 7, 5: 459 (May), 1929. K. E. P.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

How to Get Exhibits Done—There are many possibilities for the resourceful and lucky person to enlist volunteers for various kinds of exhibit construction.

There are skilled and enthusiastic amateurs in all types of craftsmanship who might be enlisted if your project is appealing to the particular individual whose aid is desired—workers in metals, wood, cardboard, electricity, chemicals, photography, and so on.

Instructors in the above may sometimes be interested in doing what you need—because of interest in the craft or the appeal of your work.

There is always the possibility that the commercial specialist may become interested in your particular project, and be willing to make a contribution of service or material, although this approach must be as carefully guarded as a request for a financial contribution.

Individuals or groups of unskilled volunteers—neat, systematic and interested—may do certain types of work: cutting, pasting, and other simple operations.

The executive or the exhibit committee may be relieved of many errands; much detailed effort in locating or check-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

ing up on commercial specialists; searching for materials for certain uses; gathering particular information. The volunteer may use the telephone to interview people, write letters, or search in books as the job may require.

A "Census of Useful People" will lay the foundation for securing desirable volunteers for future needs. See pages 201–202 in *The A B C of Exhibit Planning*—to be found in local libraries.

Again—it may be urged that experience has shown that capable people have been enlisted in exhibit construction who have had no previous contacts with the work of the agency or who had revealed no interest whatsoever in its field of work—but they *did* become interested in doing their specialty on behalf of the agency.

"Publicity as a Motive Factor"—The Health Division of the National Conference of Social Work held one joint session with Educational Publicity Division at San Francisco, June 26–July 3. "Publicity as a Motive Factor in Health Education: The Psychology of Motives; How Health Publicity Is Planned to Put Motives to Work," will be a further development of the theme considered by the Public Health Education Section of the A. P. H. A. at Chicago.

There were 19 sessions on publicity at San Francisco, with exhibits, and health workers prominent among those present.

A Panorama Exhibit—The old-fashioned panorama—even now to be found in miniature forms in toy stores—may be adapted to exhibit uses. The visitor sees an open box or simple stage front in which appears a series of pictures, with brief captions. The pictures move horizontally across the back of the stage, or perpendicularly from top to floor.

The continuity of pictures and other material will be mounted on a continuous strip of tracing cloth or other material, running over several rollers. Simpler construction will be possible by omitting the continuous feature, and winding from one roller to another, and re-winding after each showing. The winding can be by sand wheel or electric motor, or by a crank turned by a visitor or attendant.

The captions may run along with the story or may be displayed in an adjoining stage front. In this case the captions and pictures will run from top to bottom, with both "shows" mounted on the same axle or shaft so that there will be exact synchronization.

The story may be made up with pictures cut from magazines, or may be sketched by an artist or by children, or may be silhouettes. If the latter, the moving curtain should be tracing paper so that with a moderate light behind the pictures will stand out boldly.

Help the Health Editors—The editors of health journals and organs of health agencies receive many copies of pamphlets and other printed matter, usually without the information needed for intelligent comment. Is the material for sale? Is it available for free distribution? Terms? Will single copies of a report or folder be supplied as samples to health workers? Free, or for how much?

Many state or local publications are more interesting if the reader can learn the cost, the process used, the number of copies, and who received them. And frequently the reader needs to know why a publication was issued, or the result desired.

Judging by our own experience, life is too short for the editor to write for this information. Sometimes it is done, but usually we must do the best we can—give the surface information, or drop the publication into the waste basket.

Incidentally, more samples from the

field should reach the editors and the offices of the national health organizations.

Exhibit Ideas from Books and Other Sources—Many ideas to adapt to exhibit or display use may be found in books on handicraft or home amusements.

Toy stores will suggest forms which may be made over and be used to express a health idea or fact.

Window displays will include devices which may be copied or adapted.

Outside Wondering What's Inside—For school or exhibit purposes:

1. A box—set on a table or stand—with an exciting title at the top.
2. Inside are 4, 5 or 6 photographs or sketches or silhouettes or transparencies telling some health message—mounted on an axle or drum so that the visitor can revolve and see the pictures in turn.
3. The handle will project from both sides—or either side—and probably with a clutch so that it can revolve only in one direction.
4. A hole in the slanted top through which the pictures can be seen as they revolve.

In practice it may be possible to have the box larger—with 2 or 3 openings so that several people can look at a time.

RADIO

"Universal Safety Series" is presented by the National Broadcasting Co. in conjunction with the National Safety Council, running through the middle of July, on Saturdays at 7:15 P.M., Eastern Daylight Saving Time.

The dialogue, well done, is an acceptable form for broadcasting health.

Simpler to work out, and effective, is a series of questions and answers. Writing the questions, especially, offers the chance to enliven the period on the air, and, of course, the answers should not be heavy even though they may be straight statements of fact.

Questions about health and health agencies could be put to a prominent citizen who has not seen them in advance, asking the audience to determine whether or not he gives the correct answers, that is, provided you have an opportunity to present the correct answers a week later.

A group of exploded health superstitions should provide interesting material, with a good chance to bring in the reasons for modern health practices.

Something in the nature of a "stunt," like one of the above, given now and then may serve to attract new listeners, or bring back some who have tired of the routine radio talks on health topics.

POSTERS

A help toward better posters and placards is the study of the best of advertising posters. A stimulating aid in that direction is "Posters and Publicity," edited by Mercer and Guant, *The Studio*, London. It is an introductory review of poster art, and 140 pages of posters, booklet and folder covers, and a few advertisements. Many countries are represented. William E. Rudge, 475 Fifth Ave., New York, N. Y. *Cloth $4.50, paper $3.00.*

Instead of being devoted to specific information, graphically presented, many of the best posters now attempt nothing more definite than the creation of a mood in the spectator. They still hold to the old rules which have been tested by centuries of use. They remain simple summaries, direct, taken in at a glance, easily remembered. But they have in many instances dropped the insistence on a special fact to be conveyed, and prefer to make the information supplementary or incidental to the feeling. If the article advertised is represented in an atmosphere which induces friendliness in the spectator, the extra "punch" of a slogan is thought to be detrimental rather than helpful.—
New York Times, Dec. 17, 1928.

EDUCATIONAL MATERIAL

An example of coöperation by non-health movements is *Mother's First Book*, by Cora Wilson Stewart, published with the coöperation of Cleanliness Institute by the National Illiteracy Crusade, American Red Cross Bldg.,

Washington, D. C. "This book is a first reader for women who cannot read or write. It is for the teacher's use in teaching such women, and by teacher is meant any person who helps a woman to learn." It starts with the baby and what mother can do for the baby, and includes much simple health material. Those who through schools or volunteer teachers can reach illiterate women should write for a *free* copy.

The newest "baby book" is that issued by the John Hancock Mutual Life Insurance Co., Boston, Mass., "Your Baby's Care," by Susan P. Souther, M.D. Photographs and sketches are included, but never both on the same page, a colorful cover, good type and paper, *and an index.* 30 pages—all about the baby. It does not attempt to cover all of childhood. *Free.*

REQUESTS

Please send the editor your answer to this request from a visiting nurse association: "We would like to know where we can secure colored charts showing the different types of eruptions and conditions of the membranes of the throat for use in teacher groups. I am under the impression that Detroit uses something of this kind with its teachers. Can you advise me?"

Something to turn back to is "What Do You Want?" in the *Journal* for December, 1928, page 1546.

REGRETTABLE BUT TRUE

That no publication date appears on the report of a study of the health of a group of boys, issued by one of the largest of the voluntary health agencies. [Careful readers will find buried in the text the date when the study was started.]

That so many health survey reports carry no obvious indication on the cover or title page of the authority responsible for the issuance of the report, and that so frequently no address is given to which communications may be addressed.

CHILDREN AND SCHOOLS

A picture of the tuberculosis double-barred cross as formed by Health Crusaders, in "Fighting Tuberculosis and Heart Disease." Illustrated review of the activities of Tuberculosis and Health Society, 51 Warren St., Detroit, Mich. *4 cents.*

"The Health Land Herald": how a fourth grade wrote a health newspaper. *Hygeia.* Mar., 1929.

The Junior Red Cross calendar for May includes writing news stories on health and on making a plan for health during vacation.

"The straws did the trick," claims the Pine Plains Parent-Teachers' Association because "the mothers report that many of the children who would never drink milk at home are now taking it as a matter of course." Just before the lunch hour each child received a small bottle of milk, a straw and a cracker. The 4–H Club bought the straws.—Reported by Dutchess Co., N. Y., Health Association.

"Teaching Health in Schools," in *S. C. A. A. News,* 105 East 22d St., New York, N. Y., Mar., 1929, describes new project of S. C. A. A. in cooperation with Health and Physical Education Division of New York State Education Department. *Free.*

A wealth of material for school, club and home use is to be found month by month in *Safety Education,* Educational Division, National Safety Council, 1 Park Ave., New York, N. Y. *Sample free.* Every issue includes a separate poster for the classroom or the child's room at home.

Apply to the same address for "Public and School Safety Posters—1929," an illustrated catalogue. *Free.*

BOOKS AND REPORTS

The Balance of Births and Deaths—*By Robt. R. Kuczynski. New York: Macmillan,* 1928. 140 pp. Price, $2.00.

This is the first of the series of population studies contemplated by the Institute of Economics. In the present volume a comprehensive statistical survey is made of the trend of human fertility in Northern and Western Europe. Subsequent studies will deal with fertility in the remaining parts of the world for which data exist. Once the facts as to fertility are known, analyses will be made of the social causes and of the political and economic consequences of differences in fertility. In the reviewer's opinion this is by far the best statistical statement yet made of natural increase in the territory studied. Provided the contemplated studies maintain the high level of the present one, an end will shortly be made to the countless factually unsupported statements made by many ill-informed writers on population.

The data and conclusions presented and the method employed will be of value to population students, for Dr. Kuczynski, one of the outstanding statisticians of Europe, applies a method designed to show whether the populations of the European countries studied are maintaining themselves; that is, neither potentially increasing nor potentially decreasing. This method, hitherto practically unknown to Americans, will be understood by any high school student.

At present the population of Europe contains an unduly large proportion of women of childbearing age, and an unduly small proportion of children and aged persons. This age composition in turn makes for a high birth rate and a low death rate. Consequently the excess of births over deaths gives no true picture of the underlying trend. Dr. Kuczynski's method, despite its simplicity, gives as true a picture of the fundamental trend as some of the involved mathematical methods employed in this country.

So far as Northern and Western Europe is concerned the Malthusian devil, if not now chained, soon will be, according to Dr. Kuczynski's findings. At present 100 mothers give birth to but 93 future mothers. "With a fertility and a mortality as they prevail at present, the population of some smaller countries still shows a genuine growth, but the population of the larger countries, France, and especially England and Germany, is doomed to die out." While an essential change in mortality or in fertility can halt this trend, the future "depends mainly on the trend of fertility," for future reductions of mortality in the childbearing years cannot be very great.

Whereas the average number of children per woman (married and unmarried) was 4 or 5 forty years ago in all the countries studied except France and Ireland, the average in 1926 had fallen below 3 practically everywhere and was but 2.3 for the area studied.

The chapter on birth rates shows that birth rates declined continuously during the 19th century, nor did the World War essentially change this trend. By 1927 the birth rates of Denmark, Sweden, and Switzerland had fallen below that of France. Eventually, it appears, rates of the same magnitude will prevail in all the countries studied.

No public health statistician or population student can afford to be without this book, which, in addition to all its

other merits, contains a mine of carefully corrected birth rate and other vital statistical data.

JOSEPH Y. SPENGLER

Hygiene and Public Health (*Parkes and Kenwood*). (*8th ed., rev.*)—*Revised by Henry R. Kenwood, C.M.G., M.B., and Harold Kerr, O.B.E. Philadelphia: Blakiston,* 1929. 823 pp. Price, $7.00.

The present edition of this work—the eighth of the joint authorship—has been prepared by Professors Kenwood and Kerr, though the name of Dr. Louis C. Parkes, who originated the book, and for many years was its sole author, is still retained.

Few books have been before the medical public longer than this, and it is safe to say that none have retained their popularity to a greater extent. All editions have been favorably received, not only in England, but in this country, as a result of real merit.

The present edition has been brought up to date, and is a worthy successor to those which have preceded it. The only drawback for American readers is that rules and regulations concerning housing, tuberculosis, milk, etc., are those official in England. The principles, however, are equally applicable in this country.

The printing and make-up are excellent. The book can be recommended without hesitation as a text and reference for all those interested in public health.

M. P. RAVENEL

Five Years in Fargo—*Report of the Commonwealth Fund Child Health Demonstration in Fargo, N. D., 1923–1927. New York: The Commonwealth Fund Division of Publications.* 207 pp. Price, $1.00.

Public health administrators and all volunteer workers in the field of public health will welcome this excellent account of the most interesting and successful health demonstration yet reported. Those who contemplate enlisting community support for similar demonstrations or who plan any sort of progressive, forward-looking health program can do no better than study this report.

Fargo is a strategic point geographically. Wide-awake, progressive groups of practicing physicians, interested from the standpoint of scientific medicine, with the citizenship generally interested in promoting the "boost" spirit to make the "biggest little city in the Great Northwest the biggest little city in the world," must have convinced the committee of award that Fargo would be sure to win if given the opportunity for a real health demonstration.

It is refreshing to one in the public health field to note the frank appraisal of each activity in this final evaluation. Application of the rating schedule of the American Public Health Association, worked out originally on the score of 86 smaller cities, proves to the satisfaction of every student that this demonstration was well worth while. As was to have been expected, the greatest gains demonstrable by such a rating schedule occur in the special fields related to maternity, infancy, preschool age and childhood. That the general rating score should have increased from 320 points out of a possible 1,000, the year before the demonstration began, to 827 during the last year shows how largely public health results may be determined by concentrating upon these appealing programs.

To see vital statistics increase within a 5-year period from a score of 16 to 56 out of a possible 60 points in the rating schedule, communicable disease control leap from 69 to 155 out of a possible 175, prenatal service reach the maximum score allowed in the rating schedule, infant service approach the full allowance by reaching 69 out of 75, preschool service acquire the full ap-

praisal value of 50 points, school health service score 141 out of 150 points, and the laboratory activities reach the maximum rating during the last two years of the demonstration, should convince anyone of the value of the experiment.

The per capita cost of $1.59 is well within the financial reach of any forward-looking community. Those who figure in dollars and cents, and who question whether a well worked out health program may be fully sold to a community, need not go beyond pages 49 and 50 to be convinced of the monetary value of extensive health activities properly demonstrated.

The City of Fargo annually increased its health funds from $20,663 in 1922, and $24,132 the year the demonstration began, to $36,000. At the end of the demonstration when Fargo took over all activities, the total budget for health activities was $40,600.

The growing interest shown by the teachers and the mothers of school children examined, and that kept up by the various community service clubs and the public press, all tend to prove in a most practical way that the community realized its full responsibility, and heartily joined in a sort of co-partnership with the director of the demonstration, his staff and the medical profession in assuring success.

This little volume should be in the library of every public health administrative officer and every volunteer health organization.

B. FRANKLIN ROYER

The Facts of Modern Medicine. *A Simplified Statement of Established Knowledge on Medical Subjects, with Reference also to Certain Current Misconceptions—By Francis W. Palfrey, M.D. New York: Appleton,* 1929. 490 pp. Price, $5.00.

As stated in the preface, the author had two objects in the preparation of this book: to lessen the gap between the knowledge of medicine common to the general public and that of the medical profession; and to give to students a preliminary view of medicine drawn in a broad outline, but with its parts in true perspective. While we doubt the wisdom of this dual purpose, we believe that the book will come as near to fulfilling its object as possible.

As a book for the layman, it is excellent—accurate in detail and well written—perhaps a little bit too smoothly to hold the reader's attention.

The illustrations are good, the microphotographs especially so, though we cannot help wondering what the average layman will make out of some of them. Probably they are put in for the beginning medical student. An excellent crayon portrait of Osler, by Sargent, faces the title page.

The printing and general make-up of the book are excellent.

M. P. RAVENEL

Animal Parasitology—*By Robert Hegner, Francis M. Root and Donald L. Augustine. New York: Century,* 1929. 731 pp., 280 figs. Price, $6.50.

This book gives the gist of the instruction in protozoölogy, helminthology and medical entomology as offered at the School of Hygiene and Public Health of Johns Hopkins University, and provides an adequate and comprehensive single textbook in parasitology which utilizes some of the large amount of valuable material accumulated by the International Health Board and other agencies of the Rockefeller Foundation.

The attempt to cover so large a field within the compass of 600 pages is disastrous, in that illustrations are of necessity reduced; the text becomes more or less a thinly clad skeleton; and the proportion required for the necessary commonplace matter is large. The attempt to include the parasites of the domesticated animals is very incom-

pletely carried out, a few of the better known being rather superficially treated. This information is of value to students of biology, but is quite inadequate for veterinary purposes. The book has only about half as many pages and illustrations as the section dealing with animal parasites in the well-known *Précis de Parasitologie,* of Brumpt, which treats only of human parasitology.

The work falls into three equal sections. The first, on protozoölogy, is by Professor Hegner of Johns Hopkins School of Hygiene and Public Health, the second by Professor D. L. Augustine of Harvard Medical School, and the third by Professor F. M. Root, a colleague of the first named author. The section on protozoölogy is a condensation of the author's books *Human Protozoology* and *Host-Parasite Relations,* with some additions which make the treatment somewhat more comprehensive.

The second part is less satisfactory in its treatment of the Platyhelminthes than in that of the Nematheiminthes, where much new material is assembled concerning hookworm, hookworm surveys and campaigns. There is little new in the way of illustrations, old friends which have appeared in every textbook since the days of Leuckart still adorning the pages of this latest work, while some of the new ones are no improvement over the old. The chapter on methods will be very welcome to all public health laboratory workers.

The closing section on medical entomology covers a large field and has been handled with skill. There are new and significant illustrations, carefully worked out keys, clean-cut accounts of measures for control and prevention of insect vectors, and discussions of the relations of insects to various diseases.

The bibliography is extensive, perhaps needlessly extended, and printed in larger type than necessary. A more careful handling of the typography, size of illustrations and set-up would permit a considerable gain, either by reducing size and cost, or increasing the text and illustrations without increase of pages.

This book will be of particular value to technicians in public health laboratories and as an important work of reference for public health workers. Preventive medicine has made some of its most inspiring and noteworthy contributions through research in parasitology. Every worker in this field should review the achievements in this field as presented for inspiration, and face anew the problems which he will find assembled in this comprehensive, authoritative and up-to-date work. C. A. KOFOID

What Everyone Should Know about Eyes (*National Health Series*)—*By F. Park Lewis, M.D. New York: Funk & Wagnalls,* 1928. 70 pp. Price, $.30.

Much valuable information for the layman is crowded into this little book. The mechanism of sight is first explained, particular attention being directed to near-sightedness and squint. Reasons for, and methods of, examination are so outlined that the reader may visualize the procedure.

Part II considers trachoma, birth infections, accidents and injuries, showing how our knowledge of preventive measures has been increased.

The author has recognized the necessity of education in regard to diseases affecting the optic nerve, cataract, iritis, and glaucoma; also pointed out the changes that take place in the eye in old age.

The final chapter on hereditary eye defects answers some questions and provokes thought. Dr. Lewis is to be commended for presenting useful scientific information in popular terms, thus rendering admirable service to the cause of education. CONRAD BERENS

Why Not Grow Young? or Living for Longevity—*By Robert W. Service. New York: Barse,* 1928. 266 pp. Price, $1.50.

Youthful Old Age. How to Keep Young—*By Walter M. Gallichan. New York: Macmillan,* 1929. 236 pp. Price, $2.50.

We confess frankly that we are tired of books written by non-medical men who think that some fad or another has saved their lives and preserved their health. Public health is popular, and we cannot help suspecting that the financial element is back of some of the apparent desire to spread alleged information.

Both of the books mentioned above are well written—that by Mr. Service in a breezy, robust style, which makes it very attractive, that by Mr. Gallichan in a more conservative and philosophical style, which, however, is pleasing.

One cannot but be astonished at the cocksure tone which both exhibit. Verily, verily, mortals rush in where angels fear to tread. Even the question of blood pressure presents no difficulties to Mr. Service. His fad is Royat, and he even goes so far as to make the absurd statement that physicians will not endorse Royat because their business is to cure by drugs rather than nature, and knowing what Royat will do, "they will lose a profitable patient." He gives 100 "do's and don't's" for the middle aged man, which compels one to wonder why he should be more of a fool before 50 than after, as far as the preservation of health goes.

Mr. Gallichan is an author of parts, proudly claiming 52 volumes for his 67 + years. He has developed a philosophy of life which is attractive. If his knowledge equalled his philosophy, we would have no fault to find. He is evidently a disciple of Sir Arbuthnot Lane.

Both authors have read widely without the fundamental training necessary for understanding. Both of them attribute their health to their fads instead of to a God who has been kinder to them than to the public in allowing them to continue their writing.

We cannot but remember the story of Bishop Berkeley, of whom it was said "To Berkeley every virtue under heaven." In spite of his learning, to him tar water was a panacea for every ill—mental, spiritual and physical. As Oliver Wendell Holmes put it, he was a great and good man, but held two very peculiar ideas—that the material universe and all it contained was nothing, while tar water was everything. As expressed by the same beloved physician, his life illustrated a point which Messrs. Service and Gallichan might well take into account:

> Berkeley himself afforded a remarkable illustration of a truth which has long been known to the members of one of the learned professions, namely, that no amount of talent, or of acquirements in other departments, can rescue from lamentable folly those who, without something of the requisite preparation, undertake to experiment with nostrums upon themselves and their neighbors.

M. P. RAVENEL

Proceedings of Sixth Annual Short School Texas Association of Sanitarians. *Assembled at San Antonio, Texas, November 7–10, 1928. Austin: Texas Association of Sanitarians.* 188 pp. Price, $1.00.

These proceedings contain the usual amount of interesting and instructive reading. Health education receives the largest proportion of space and includes discussions of such subjects as "Coöperation in Public Health by Veterinarians" and "The Plumber and His Trade."

Communicable diseases and foods and drugs are allotted sections of the journal. In the first of these there is an able paper on the effect of rat extermination on health and economy.

Fifteen pages are given over to water sanitation, and following that various

phases of sewage treatment are discussed. In the later section, Mr. Guzman of the University of Mexico outlines briefly sewage disposal conditions in his country.

In the back of the book 40 pages are needed to give the public health and welfare organizations and allied groups in Texas; lists of the dairies, creameries, licensed veterinarians, public health nurses and master plumbers; and a proposed state plumbing code.

ARTHUR P. MILLER

Advice to the Expectant Mother on the Care of Health—*By F. J. Browne, M.D. Edinburgh: E. & S. Livingstone*, 1928. 48 pp. Price, $.50.

The benefits to be expected from regular physical examinations during pregnancy are directly and simply stated. What might be termed the standard information on prenatal hygiene, the common disorders of pregnancy, and the general care of the new-born baby are concisely given. The symptoms and importance of the more serious disorders are clearly explained.

This small book gives in the most orderly fashion and in easily understandable language all that is important, without unessentials. C. E. HAYES

Protozoology. *A manual for medical men—By J. G. Thomson and Andrew Robertson. New York: Wood*, 1929. 376 pp., 4 col. pl., 220 figs. Price, $11.00.

This manual of protozoölogy differs from the numerous others in this field in that it is written by medical men for medical men, but without discussions of therapy or epidemiology. It deals with malaria (64 pp.), coccidiosis (16 pp.), babesiasis (4 pp.), amebiasis (38 pp.), intestinal flagellates (26 pp.), leishmaniasis (21 pp.), trypanosomiasis (29 pp.), spirochetes (12 pp.), syphilis, yaws, etc. (11 pp.), leptospirosis (7 pp.), and other minor protozoan infections of man. Epecially valuable are the discussions of the pathologies of the various protozoan infections, notably that of malaria, in which field the senior author is a world authority.

The authors have had access, through their connections with the London School of Tropical Medicine, to large collections of autopsy material and have rendered a great service to protozoölogists and medical men alike in their judicious and ample use of this illustrative material and their comprehensive discussions of it. There is a valuable chapter on fallacies and puzzles in blood examination, and another on common objects in stools other than protozoa. The chapter on coccidiosis has new material showing sources of contamination in human feces from the coccidia of the sardine.

There are many new illustrations. The four colored plates are excellent, but many of the photomicrographs exhibit poor technic in photography or reproduction, or both. Some of the text figures are quite crude, with little attention to cytological detail, and are unduly enlarged in many instances, thus adding materially to the cost of an already quite expensive book. There is a good chapter on the various technics of fixing, staining and preparation of culture mediums, an etymological glossary and a full index. C. A. KOFOID

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Typhoid Fever—The annual compilation of municipal typhoid fever death rates by sections. The southern states, as usual, are higher than elsewhere in the country, but their rates are lower than for previous years. The record as a whole is a good one. Nine cities had no deaths.

Typhoid in the Larger Cities of the United States in 1928. J. A. M. A., 92, 20: 1674 (May 18), 1929.

Diphtheria Death Rates—The same statistical comparison of municipal experience in relation to diphtheria. Eleven cities had death rates of 2.0 or less (Grand Rapids 0.0) and 10 had rates between 20.0 and 14.6. Food for much thought, speculation and mutual recriminations.

——. Diphtheria Mortality in Large Cities of the United States in 1928. J. A. M. A., 92, 21: 1759 (May 25), 1929.

Antarcesis—Suggested by the author to designate protective power against disease born of normal or balanced physiological activity as distinguished from immunity resulting from invasion. The paper is about variations in incidence of poliomyelitis, and is a good one.

AYCOCK, W. L. A Study of the Significance of Geographic and Seasonal Variations in the Incidence of Poliomyelitis. J. Prev. Med., 3, 3: 245 (May), 1929.

Watershed Protection Practice—A symposium on protecting potable water supplies by five local representatives, and from the standpoint of the State Board of Health. Very interesting for those who are faced with this vexing problem.

BURT, JOHN, *et al.* Watershed Protection Practice in California. J. Am. Water Works A., 21, 5: 589 (May), 1929.

Anti-Tuberculosis Work—Sound comments on a quarter century of tuberculosis preventive measures, with emphasis on doctor-patient relationships.

DEVINE, E. T. The Quarter Century Health Crusade. Survey, 62, 4: 229 (May 15), 1929.

Care of Chronic Cases among Children—Telling of the measures taken for the care of chronically sick children in Boston. One-sixth of all chronic cases are children.

EAVES, L. Children Who Are Chronically Sick. Survey, 62, 4: 241 (May 15), 1929.

Camp Sanitation—Points are listed which should be observed in inspecting summer camps.

FELSEN, J. A System of Classification of Summer Camps. J. A. M. A., 92, 21: 1789 (May 25), 1929.

Medical Student Health Examinations—How Harvard medical students are impressed with the value of health examinations. Each student receives at least four examinations and gives at least two to other students. They become interested in the follow-up of their own cases and try to keep fit. Is it too much to expect that this so evidently sensible scheme will be adopted in all medical schools?

FITZ, K. Periodic Health Examinations as a Part of a Medical Student's Curriculum. J. A. M. A., 92, 20: 1645 (May 18), 1929.

Anti-Malarial Measures—A dusting outfit is described by which Paris green mixed with lime may be applied effectively to waters in which anopheline mosquitoes breed.

LE PRINCE, J. A. Development of a Power Dusting Device for Applying Paris Green as an Anopheline Larvicide. Pub. Health Rep., 44, 17: 1001 (Apr. 26), 1929.

Tuberculosis Skin Test—The simple and reliable percutaneous tuberculin reaction described is suggested in preference to other procedures because it is easier to do and causes less discomfort to the patient.

LOVETT, B. R. The Percutaneous Tuberculin Reaction. Am. J. Dis. Child., 37, 5: 918 (May), 1929.

Rural Health—Tables are given showing increase by counties in rural health administration. Despite the increase, more than 77 per cent of the rural population has no adequate health service.

LUMSDEN, L. L. Extent of Rural Health Service in the United States, 1925–1929. Pub. Health Rep., 44, 20: 1192 (May 17), 1929.

The Year in Public Health—Some of the high spots in 1928 are reviewed; the activities of the federal health service, the several funds, and progress in biologic and economic research are included.

MOORE, H. H. Progress in Public Health and Medicine, 1928. New England J. Med., 200, 20: 1045 (May 16), 1929.

Etiology of Poliomyelitis—Evidence is offered supporting the view that a streptococcus (as suggested by Rosenow) cannot be regarded as identical with the filtrable virus of poliomyelitis.

OLITSKY, P. K., *et al.* Relation of Streptococci to the Spinal Fluid of Experimental Poliomyelitis. J. A. M. A., 92, 21: 1725 (May 25), 1929.

The Decline of Nations—One of those vague, "What causes that?" dissertations evidently so dear to the heart of the Britisher. All about the troubles that came to Greece and Rome. The author casts a worried eye to America and shakes his head over us. Wealth, luxury and vice are prominently mentioned.

OLIVER, THOMAS. Some Factors Which Have Made for the Decline of Nations. Med. Off., 41, 19: 201 (May 11), 1929.

Leprosy—The so-called leprosy bacillus is an actinomyces, a soil organism of wide but irregular distribution. Leprosy is primarily a soil infection presumably through wounds. These conclusions will change our conception of rational control measures, if they are generally accepted.

WALKER, E. L. Some New Aspects of the Etiology and Endemiology of Leprosy. J. Prev. Med., 3, 5: 167 (May), 1929.

Less Sugar Instead of More—A delightfully mild mannered slap at the propaganda of the sugar and candy manufacturers. Should be read by every sanitarian.

SHERMAN, H. C. The Problem of Sweets for Children. Child Hyg. Bull., 5, 3: 65 (May), 1929.

Diphtheria Prophylaxis—An unfavorable report on the use of Larson's combined diphtheria and scarlet fever toxins ricinoleated. The author sees little advantage in toxoid over toxin-antitoxin mixture. In a following paper the author reports no results in the treatment of 14 cases of measles with Degkwitz's animal immune serum.

SILVERMAN, A. C. Immunization with Modified Toxin. Am. J. Dis. Child., 37, 5: 957 (May), 1929.

Detecting Scarlet Fever Carriers—A rapid and simple laboratory method is suggested for the detection of scarlet fever carriers by means of an opsonic test.

TUNNICLIFF, R., and CROOKS, T. T. The Healthy Carrier in Scarlet Fever. J. A. M. A., 92, 18: 1498 (May 4), 1929.

Influenza Incidence Index—Attack rates from influenza studied in sample populations in 11 representative cities showed a range of from 11.3 to 17.9 per 100 persons canvassed, in 1928–1929. This was about half the 1918 rate.

VELDEE, M. V. Morbidity in the Influenza Epidemic of 1928–1929. Pub. Health Rep., 44, 19: 1133 (May 10), 1929.

Sunlight and Bacteria—A well planned demonstration of the bactericidal properties of sunlight, direct and indirect, and the component light rays. The application of the facts demonstrated is discussed. A very useful lesson.

MEADER, F. M. Sunlight as a Disinfectant. City Health (Detroit), 13, 3: 3 (Mar.), 1929.

Control of Pneumonia—Valuable summarization of the status of serum therapy in pneumonia and a suggestion of the inclusion of vaccine therapy as well in the treatment of the disease.

ZINSSER, H. An Immunological Consideration of Pneumonia and a Discussion of the Rational Bases for Vaccine Therapy. New England J. Med., 200, 17: 853 (Apr. 25), 1929.

BOOKS RECEIVED

MEDICINE. ITS CONTRIBUTION TO CIVILIZATION. By Edward B. Vedder. Baltimore: Williams & Wilkins, 1929. 398 pp. Price, $5.00.

THE NEW HEALTHY LIVING. By C.-E. A. Winslow and Mary L. Hahn. New York: Merrill, 1929. Book I, 312 pp. Price, $.84. Book II, 438 pp. Price, $1.00.

THE PROCESS OF HUMAN BEHAVIOR. By Mandel Sherman and Irene Case Sherman. New York: Norton, 1929. 227 pp. Price, $3.00.

PHYSIOLOGY AND HUMAN LIFE (rev. ed.). By Robert A. Budington. New York: Silver, Burdett, 1929. 395 pp. Price, $1.56.

REPORT OF FOURTH INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY, WARSAW, POLAND, MAY–JUNE, 1927. By William Seaman Bainbridge. Menasha, Wis.: Collegiate Press, 1929. 246 pp.

HOUSING PROBLEMS IN AMERICA. Vol. 10. Proceedings of the Tenth National Conference on Housing, Philadelphia, January 28–30, 1929. New York: National Housing Association, 1929. 355 pp. Price, $3.00.

DUNN'S FOOD AND DRUG LAWS SUPPLEMENT, JANUARY 1, 1929. Edited by Charles Wesley Dunn. New York: United States Corporation Co., 1929. 228 pp. Price, $2.00.

TUBERCULOUS INTOXICATIONS. CONCEALED AND MASKED TUBERCULOSIS. By Joseph Hollós. New York: Wm. Wood, 1928. 132 pp. Price, $3.25.

THE ORIGIN OF MALIGNANT TUMORS. By Theodor Boveri. Baltimore: Williams & Wilkins, 1929. 119 pp. Price, $2.50.

BACTERIOLOGY FOR NURSES (3d ed., rev.). By Mary A. Smeeton. New York: Macmillan, 1929. 335 pp. Price, $2.60.

FOUR CENTURIES OF MEDICAL HISTORY IN CANADA. By John J. Heagerty. Toronto: Macmillan, 1928. Vol. I, 395 pp. Vol. II, 374 pp. Price, $12.00.

A WATER PROGRAM FOR CAMPS. By Thomas K. Cureton, Jr. Philadelphia: Blakiston, 1929. 162 pp. Price, $.60.

JAMAICA HEALTH STORIES AND PLAYS. By B. E. Washburn. Kingston: Government Printing Office, 1929. 110 pp. Price, $1.00.

COLLECTED STUDIES FROM THE BUREAU OF LABORATORIES, DEPARTMENT OF HEALTH, CITY OF NEW YORK. By William H. Park. New York: Department of Health, 1929. 583 pp.

THE NURSE IN PUBLIC HEALTH. By Mary Beard. New York: Harper, 1929. 217 pp. Price, $3.50.

THE PHYSIOLOGY OF LOVE. By George M. Katsainos. Boston: Author, 1929. 326 pp. Price, $4.00.

PSYCHIATRY IN INDUSTRY. By V. V. Anderson. New York: Harper, 1929. 364 pp. Price, $4.00.

THE WOMAN WHO KNOWS HERSELF. By Elizabeth Sloan Chesser. New York: Dutton, 1929. 111 pp. Price, $1.00.

MODERN BIOLOGY. By J. T. Cunningham. New York: Dutton, 1929. 244 pp. Price, $3.00.

RACE AND POPULATION PROBLEMS. By Hannibal G. Duncan. New York: Longmans, 1929. 424 pp. Price, $2.50.

SANITATION AND HEALTH. Prize essay presented to the Forty-seventh Annual Convention of the National Association of Master Plumbers, Inc., June 25–27, 1929.

MODERN ARCHERY. By Arthur W. Lambert. New York: Barnes, 1929. 306 pp. Price, $3.00.

ANNUAL REPORT OF THE DEPARTMENT OF HEALTH, BUFFALO, N. Y. Year ending December 31, 1928.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Fort Worth, Tex.—A health and welfare survey and appraisal of the city of Fort Worth by the Director of Public Health and Welfare is a document of 140 mimeographed pages of unusual interest to health and welfare administrators. The new city appraisal form has been utilized for the health survey, and on a similar basis, an appraisal of welfare work has been developed. The latter form is the first of its kind which has come to the attention of the reviewer.

This city of 191,448 population reports a birth rate of 15.5, a death rate of 10.5 and an infant mortality rate of 77.9. There are 12 hospitals and clinics in the city with 708 beds, 585 for white, 101 for colored and 22 for day patients. Exclusive of the Independent School District, there are 41 colleges and schools of different character in Fort Worth. There are about 22 agencies doing health and welfare work. There are 201 white physicians, not including the 4 doctors in the Department of Public Health and Welfare, and 11 colored physicians.

About 85 per cent of the milk supply is pasteurized. The major portion of the milk is delivered in the city within a few hours after production, within a radius of 50 miles of the city. There are approximately 10,066 cows producing 19,333 gallons of milk daily. Some 1,519 food establishments are under supervision.

For the purpose of administration and operation, the Department of Public Health and Welfare is divided into 6 separate divisions or bureaus: administration, communicable disease control, nursing, inspection, laboratory, and welfare. All free clinics and dispensaries, maternity hospitals and other hospitals maintained within the city are under the supervision of the director of this department.

Following his recommendations regarding future program, the director makes a plea for unity of purpose.

> The health and welfare of a community should not be bartered or maligned but should be upheld by all who are capable of thinking. "Unity of purpose" should be the watchword, and everyone should carry the message home to some one so that when we pass on we may look back upon an accomplishment that lives on and on. If, in surrendering the personal equation, we may help to serve some child who is unable to think for itself, is it not far better for the community and for our own selves? My earnest plea is that everyone doing any character of work for the promotion of health and welfare unite his or her efforts for a common achievement.

New Mexico—The fifth biennial report for 1927–28 carries on the inside of the front cover 21 items on, "What the New Mexico State Bureau of Public Health Does for You," all at a cost of 7½ cents per person in taxes. There is a table of contents at the front and an alphabetical index at the back. The inside of the back cover lists the bureau personnel and the outside gives an organization chart of the Board of Public Welfare with the bureaus of public health and child welfare.

A comprehensive campaign for complete registration of births and deaths was worked out in coöperation with the U. S. Bureau of the Census, the U. S. Children's Bureau, the American Public Health Association and the Rockefeller Foundation, to be started in the fall of 1928.

Malaria cases appeared in one county in large numbers and led to the introduction of active control measures. Paris green was regularly dusted on all mosquito breeding pools and ditches

throughout the settled portion of the county. Regular checks indicated a large reduction of mosquitoes. Quinine was also distributed to cases and carriers unable to provide it for themselves.

For several years, regular health courses have been advocated in the normal schools. Through the coöperation of the state and national tuberculosis associations, a trained teacher was supplied to two of the normal schools in the summer of 1927. As a result, permanent courses have been established and will doubtless be enlarged. The State University has created a Department of Hygiene with a comprehensive plan for development. The health department maintains a loan library of books and periodicals.

Vermont—An outbreak of rabies early in 1927 and the flood of November of that year receive special consideration in the department of public health report for the biennial period ending December 31, 1927. From February to August, 21 dogs, 4 cows, 1 calf and 3 sheep were found to have rabies, but no human cases occurred. Prompt control measures were exercised by the Department of Agriculture and Department of Health and in March an act relating to the control of rabies was passed by the legislature.

As a result of the flood, some 5,500 persons received typhoid inoculation. It is noteworthy that diseases due to exposure and exhaustion, such as colds and pneumonia, did not occur to any considerable extent. "It is with a considerable degree of pride that we report that not a single case of typhoid fever resulted from the flood, nor was there any epidemic of any kind."

Vermont has been a fruitful field for the study of poliomyelitis and its aftercare. The epidemic of 1914 with 306 cases forcibly called the attention of both physicians and laymen to the disease, and it is an unusual case which is not brought to the attention of the Department of Health within a few hours after being seen by the physician. All cases are then followed up by the research worker and later by the aftercare nurses. "A situation has therefore worked out which offers coöperation on the part of the profession and an interested expectancy on the part of the people." During 1927, 954 patients were under supervision, 183 being new admissions.

Colorado Springs, Colo.—This is another health report attractively illustrated with photographs. Improvement in the water and milk supplies over previous years is noted. The average bacterial count of the milk of 20 dairies producing raw milk during the year was 10,065; the average for 8 producers of pasteurized milk was 14,918.

Three cases of diphtheria, with no deaths, is the record of this city with a population of 36,000. Of the 150 deaths from tuberculosis, only 4 were among persons who contracted the disease locally. There was a crude death rate of 18.03, but the resident death rate, exclusive of deaths from tuberculosis contracted elsewhere, was 11.8. An enlightening analysis of tuberculosis and total deaths is made according to occupation and birthplace. The health department expenditure was $26,176.

Hygienic Institute, Ill.—Printed on soft paper in good sized type, easily read, with a few appropriate photographs of health and hospital buildings, with carefully prepared statistical tables and descriptive text, this report is a credit to the department. The population of the three communities served, La Salle, Peru, and Oglesby, is 30,000, and the budget for the fiscal year ending June 30, 1928, was $38,000. The personnel consists of a medical director, a bacteriologist and chemist, a sanitary

officer, a chief nurse, six staff nurses, a stenographer-clerk, and a general service man. The Institute does the Metropolitan bedside nursing work and in addition offers hourly bedside nursing work to the community. This organization maintains a medical library for the use of local physicians, partially supports a hospital for the isolation of communicable diseases, and conducts a series of infant welfare and other clinics.

An infant mortality rate of 61, a tuberculosis death rate of 34 and a general death rate of 9.2 are noted. There were no cases of diphtheria reported during the year in this entire district. An appraisal of health service has been made for four years and shows a noteworthy increase in attainment from 456 in 1924–25 to 709 in 1927–28. The report concludes with a classified financial statement.

San Jose, Calif.—This city, with an estimated population of 62,750, reports for 1928 a birth rate of 12.7, a death rate of 11.6, and an infant mortality rate of 44.3. There were 669 births attended by physicians, 93 by midwives, and 5 by others. Detailed statistical tables and graphs indicate progress in the reduction of the death rate. "The broad vision of the manager and members of the city council in allowing an increased yearly budget made possible such advancement."

Prenatal cases made 256 visits to clinics and received 599 home visits by the health department. There were 1,349 visits of infants to clinics and 1,626 home visits by nurses. Preschool children made 2,163 visits to clinics and received 3,040 home visits.

Under popular health instruction it is noted that a bi-weekly postcard bulletin is sent to the press, physicians, schools and health workers. The expenditures of the department amounted to $34,469, but there was an additional revenue from inspections, permits and vital statistics of $15,231. Attractive photographs add interest to this annual health department report.

Detroit, Mich.—The greatly increased number of persons reached by the health department through printed educational material and health talks is cited as one of the outstanding developments of the year 1928. This wider distribution of literature has been made possible through the coöperation of insurance companies, milk producers and retail stores. An attempt has been made by the use of letters to keep in closer personal touch with physicians and parents. Many posters have been used. Coöperation with the newspapers has been excellent, with more feature stories, interviews and notices than heretofore.

During the year 1928, the tuberculin testing of all cows on farms supplying milk to Detroit has been carried out. The lowest typhoid fever death rate (1.0), and a decrease in deaths from violence and from automobile accidents are also noted. The general death rate was 11.6 per 1,000 population. Organic heart disease and the pneumonias continue to lead other causes of death by a wide margin.

There are 9 companies supplying bottled water for domestic use, and their plants are periodically inspected. During the year 15,729 food handlers were examined, 10,074 by private physicians and the remainder by the health department. Less than one-half of one per cent were found to be afflicted with a communicable disease.

The psychological effect on the food handler of examination and instruction is important as it keeps in the foreground of his consciousness the importance of his place in the prevention of disease. To emphasize this phase, simple, practical talks are given to food handlers at the time of examination.

The report contains helpful information regarding the work in communicable disease control and child hygiene.

The major emphasis of the school health service during the first half of the school year was placed on diphtheria prevention. The entire medical staff, augmented by extra physicians, devoted its full time to the giving of toxin-antitoxin and the Schick test. Also, more preschool children were reached than previously. The results of prenatal clinic service are indicated by the infant mortality rates. Infants of mothers attending within 16 weeks of pregnancy had a mortality rate of 43.6; those attending within 16–28 weeks, 44.7; and those attending after 28 weeks, 71.4.

"If the prenatal clinic rate had obtained throughout the city, there would be 540 babies alive today who have died."

Hartford, Conn.—This city of 172,288 reports a resident death rate for 1928 of 10.4, a tuberculosis death rate of 71.9, a diphtheria rate of 8.7, a heart disease rate of 208, and a cancer death rate of 105. A birth rate of 18.6 and an infant mortality rate of 62.36 are recorded. It is noteworthy that all of these rates are based on deaths allocated for residence. Expenditures of the Department of Health amounted to $173,412.

There were no deaths from scarlet fever in 1927 or 1928. Eight persons with fever gave the agglutination reaction for Malta fever. In all but one, there was a history of continued use of raw cow's milk from herds known to be infected with contagious abortion. The isolation hospital cared for 59 per cent of the diphtheria cases and 45 per cent of the scarlet fever cases.

Approximately 50 per cent of the resident births occurred in hospitals. Health education work for infants and preschool children is carried on in conjunction with the general health program of the Board of Health and the Visiting Nurse Association. A total of 7,059 children were under observation during the year, with a record of 19,000 visits to health stations and 39,000 home calls by nurses in their behalf.

That the records of vital statistics shall each year be a little more accurate and complete than those of previous years is the aim of this department. The checking of each document received against all previous records having any bearing on it is an important part of this work. The careful study of the causes of death as given by physicians often results in securing information which quite changes the classification of the cause of death.

Palo Alto, Calif.—An interesting, comprehensive report of 19 pages for a city of 12,500! In 1928 there was recorded a death rate of 8.4, the average age at death being 62.4. There were 138 births to residents. For the last 3 years the infant mortality rate has been below 30, and the average for the last 10 years is 42.7, and for 1928, 29.0. There were no cases of smallpox or typhoid fever, and only 5 cases of diphtheria.

After July 1, 1929, it is stated that all milk will be obtained from tuberculin tested cows and the only raw milk allowed will be guaranteed raw and certified.

Health authorities are almost unanimous in believing that the only safe milk is a properly pasteurized milk. Intelligent dairymen are quick to see that their very existence depends upon a safe milk and readily coöperate in improvements such as these.

The health department appropriation amounted to 99 cents per capita.

Newport, R. I.—Newport's health department experienced no staff changes during 1928. The "permanent" population, estimated, was 28,687, with 5,000 additional during the 4 summer months. Deaths from all causes numbered 342, of which 29 were among infants. For 17 months, there have been no cases of diphtheria—a commendable record. A clinic for immunization of preschool children is held each spring. It is in-

teresting to note in the financial statement that $20,262 was expended in 1928, and $29,318 in 1917. The larger expenditure in 1917 is stated to have been due to a diphtheria epidemic for which $17,000 above the usual amount was appropriated.

For the most part the milk supply is obtained from sources within 10 miles of the city. This annual report marks 10 years of enforcement of a regulation permitting the sale of only certified or pasteurized milk. The average bacteria count of pasteurized milk was 27,250, and that of certified milk, 11,981, during the year. It is calculated that local consumers expended $842,404 for milk and cream, on the basis of an average daily consumption of 12,131 quarts of milk and 487 quarts of cream in 1928.

Palestine Survey Commission—The reports of the experts submitted to the Joint Palestine Survey Commission make an impressive volume of 741 pages. The last 204 pages are devoted to a study of the hygiene and sanitary conditions of Palestine in general, with special consideration of the health and well-being of the Jewish people, for whom health work is done by a variety of agencies.

The surveyors found Palestine a country of promise and possibilities so far as health is concerned. It is now in the stage of privy sanitation which all pioneering countries pass through during the course of modernization. It is stated that the problem of public health is largely economic, for the building of adequate water supply systems, the installation of good sewerage and drainage, and the establishment of modern sanitary improvements are very expensive. Public health education will require time and patience and will involve changing the sanitary habits of a large proportion of the entire nation. At present about 15 times as much money is spent for education, and 5 or 6 times as much for police protection, as for health.

Admirable work has been done in Palestine in the prevention of certain infections, notably malaria and trachoma. Prenatal and infant welfare services conducted by the Hadassah have reduced the maternal and infant mortality. It is believed that the next attack should be upon typhoid, dysentery and the diarrheal infections, because they are prevalent and preventable.

The surveyors were favorably impressed with the organization and personnel of the health department. They state that an able group is carrying on the best traditions based on English practice.

Palestine is divided into four geographic districts, each in charge of a medical officer of health, who in turn has assistant medical officers in the various subdivisions.

There are approximately 600 licensed physicians, with over 400 Jewish physicians, or a ratio of 1 to every 400 Jews in the land. Over 1,300 women are registered as midwives. The first regulation for the training of nurses was issued in 1919, since which time over 100 have completed their training and passed examinations for nurses' certificates.

The report emphasizes the need for increased funds for the extension of sanitary facilities and health personnel, together with the possibility of extension of governmental activities to include certain phases of work now carried on by voluntary agencies. The program of Hadassah, the voluntary medical organization, if adequate funds were available, might include expansion of hospital and clinic work, public health nursing and home visitation, public health education and the promotion of mental hygiene.

LEAGUE OF NATIONS NEWS

C.-E. A. WINSLOW, DR. P. H.

THE fourteenth session of the Health Committee was held at Geneva from May 2 to 8, with the president of the committee, Dr. Madsen, in the chair. Two of the three American members, Surgeon General Cumming and the writer, were in attendance.

The report of the medical director indicated satisfactory progress along routine lines. The service of epidemiological intelligence including the operation of the Singapore bureau is proceeding satisfactorily and, aside from the epidemic of mild influenza which has recently prevailed in Europe, there is nothing unusual to note in this field. A peculiarly virulent form of diphtheria has prevailed in several European countries against which ordinary doses of antitoxin are useless. In Denmark, dosage of 500,000 units has been used with success. Sanitary interchanges on industrial hygiene and on rural hygiene have been held this spring and a joint commission of the Health Organization and the International Labour Office has made a study of the relations between sickness insurance organizations and public health services in Germany and Austria. It is planned later to arrange for interchanges dealing with the questions of milk supply, sanitary engineering and housing, and provision will be made in 1930 for a general sanitary interchange in France. A study tour dealing with malaria will be made in India beginning this August.

It will be of interest to Americans to note that an entire morning of the Health Committee sessions was devoted to reports by Surgeon General Cumming and the writer on the survey and appraisal methods used for the stimulation of public health procedure in the United States and on the work of the recently organized Committee on the Cost of Medical Care.

The Health Committee voted that an account of the survey method and of the studies of the Committee on the Cost of Medical Care should be included in the publications of the Health Organization, and the medical director was invited to prepare a report on methods employed for the appraisal of public health activity and, in collaboration with the school of hygiene and health administration interested, to collect and analyze information concerning the work of health centers and other similar activities in Europe.

Reports were presented of the commissions engaged in preparing for the forthcoming revision of the *International List of Causes of Death* (in which Haven Emerson, M.D., has played a prominent part). The schedule which will be presented for consideration at the final meeting next fall includes a full list of 155 titles, an abridged list of 86 titles and a third still shorter list which may be adopted by various governments as alternatives.

The Cancer Commission presented a particularly valuable report of a comparative study made by the institutes of radiology in Stockholm and in Paris, and the Women's Clinic at Munich in regard to the radium treatment of uterine cancer. The comparison of different methods adopted by these three institutes has proved of great value, and the results obtained are distinctly encouraging.

A commission on child welfare made a preliminary report summarizing in-

tensive studies on over 5,000 infant deaths and over 2,000 stillbirths in selected districts in Austria, France, Germany, Great Britain, the Netherlands and Norway, and similar studies are now under way in certain South American countries. The European districts covered vary from a district in Norway with an infant mortality rate of 35 to one in Austria with an infant mortality rate of over 200, and a comparison of the causes of death in relation to social, economic, and medical factors in these various districts promises to prove most illuminating.

The most important matter which came before the Health Committee is the program for reorganization of the health service of Greece. The Greek government a year ago invited the Health Organization to prepare a comprehensive program of health administration, and during the past winter and spring an exhaustive survey has been made in which Dr. Haven Emerson and Dr. Allan J. McLaughlin took part. On the basis of this study a program has been prepared for the development of a school of hygiene, and technical services of malaria control and sanitary engineering, and for the gradual development during the next five years of full-time health services ultimately covering the entire country. In each prefecture there will be a health center equipped with health visitors and sanitary assistants grouped about larger centers for laboratory and technical service. Detailed plans have been prepared for the training of personnel, and salaries and conditions of appointment will be such as to make the staff of the new service a *corps d'élite*. The program has the heartiest backing of M. Venizelos, and steps will be taken to put it into force in the immediate future.

NEWS FROM THE FIELD

SCHOLARSHIP IN UNIVERSITY OF MISSOURI

THE Woman's Auxiliary to the Missouri State Medical Association, at its recent meeting, May 14, 1929, founded a scholarship to be awarded to the student graduating from the School of Medicine of the University of Missouri who is deemed most worthy on account of scholarship, character, and financial necessity. The scholarship will carry $500 annually, and will be awarded for two consecutive years to the same student.

No particular line of work has been prescribed for those students to whom the award is made, though the fundamental object is the promotion of public health work, and it is hoped that those obtaining the scholarship will interest themselves in this specialty.

MASSACHUSETTS GENERAL HOSPITAL TO CUT MEDICAL COSTS

THE medical staff and trustees of the Massachusetts General Hospital have agreed on a plan whereby hospital charges and medical fees will be set at rates well below those now paid by patients in the private rooms, and yet sufficient to cover the cost of hospital care and compensate the physicians and surgeons. This will almost cut in half the usual bill for hospital sickness of a middle class patient.

Dr. Michael M. Davis, the Director of Medical Services of the hospital, says:

> . . . At present a 2-weeks' stay of a patient in the private pavilion of the Massachusetts General Hospital with a surgeon's fee would usually cost $250 or more. . . . If a patient stayed the same period in a ward bed and paid the full ward rate, it would cost him only about $60 and the doctor's work would

be done as charity. The large majority of Americans do not want charity, yet they are unable to pay the usual high charges for private rooms and private physicians. The Massachusetts General Hospital Plan fills the gap.

This new plan will be executed in the Baker Memorial Building, a special section of the hospital, now under construction. It will have 300 beds. There will be private rooms and provisions for 2 or 4 patients in the larger rooms. Rates, including all nursing service, will be from $4 to $6.50 per day.

ROCKEFELLER FOUNDATION RECORD

SINCE May 22, 1913, the Rockefeller Foundation has paid out from income and principal a total of $144,189,400. Most of this has been spent on the training of doctors, health officers, and nurses, the creation or strengthening of institutions of medical or public health education, building up of official health organizations, promotion of field research and the demonstration of new methods.

Temporary anti-hookworm campaigns in the United States and in many other countries have been broadened into permanent official rural health organizations. Malaria has been studied more fully and methods of control worked out at home and abroad. Yellow fever has been forced to retreat from Mexico and Central America and from Northern South America, until it is now found only in Brazil and West Africa. A wartime anti-tuberculosis organization built up with Foundation aid in France has been wholly taken over by the French and is being incorporated into a general public health service.

The sum of $29,000,000 has been spent for the creation of various schools and institutes of public health; for the strengthening of medical schools in many parts of the world from London to Singapore. This does not include the building, equipment and support of the Peking Union Medical College, and aid to hospitals and the premedical sciences in China.

Up to December 31, 1928, 3,187 fellowships have been granted, to representatives of 58 countries. The international significance of these may be inferred from the fact that 1,383 of these fellows pursued their studies in countries other than their own.

SHOCK-PROOF X-RAY APPARATUS

A NEW type of x-ray apparatus, which is completely insulated in oil and with all high-voltage wires completely eliminated, has been announced by the Victor X-Ray Corporation, with the installation of the first of these machines in the Neurological Institute, New York, N. Y.

Virtually any part of a patient's body may be x-rayed from any angle without moving the patient. Manipulation of the device to the patient's position replaces the shifting of the patient's position to suit the needs of the device. Such manipulation is invaluable when x-raying badly injured persons.

STATE WIDE X-RAY FILM PROBE IN NEW YORK

ACTING Governor Lehman has appointed a committee to investigate the use of x-ray films in New York State institutions, hospitals, laboratories and clinics. Matthias Nicoll, Jr., M.D., State Health Commissioner, has been named as Chairman of the Committee.

CAMPAIGNS

THE most important and far-reaching campaign ahead is the Summer Round-Up of the Children, a health activity of the National Congress of Parents and Teachers, 5517 Germantown Ave., Philadelphia, Pa. More than 2,500 parent-teacher associations in 44 states participated in the 1928 "round-up." The plan of work is simple and workable. The "physical inspection form" was compiled by representatives of the American Medical Association and the American Child Health Association. An opportunity to coöperate with and utilize local parent-teacher associations!

"SEEING THROUGH LIFE"

THE recently released annual report of the National Society for the Prevention of Blindness presents in review pictorially, diagrammatically, schematically in word pictures and with figures the accomplishments for the year 1928. For the information of its supporters and those concerned with prevention, enough of a comprehensive picture is given to whet the appetite of the reader and convince him of the worthwhile work accomplished. Three cents in postage to the National Society for the Prevention of Blindness at 370 Seventh Avenue, New York, N. Y., will bring anyone a copy of this report who wishes to study this attractive method of presentation.

HEALTH EDUCATION CONFERENCE

THE American Child Health Association conducted a Health Education Conference at Sayville, Long Island, N. Y., June 17–21, at which contributions were received from all of the school departments which belong in a comprehensive school health program: the Elementary School, Secondary School and Teacher Training Sections. Curriculum Building and Integration was the main topic of the whole conference and each section devoted two meetings to Materials and Activities, one to Health Service and one to Problems of Organization.

Dr. John Sundwall of the University of Michigan, Fellow, A. P. H. A., was Chairman of the General Sessions and Dr. W. F. Walker, Field Director of the Committee on Administrative Practice of the A. P. H. A., represented this Association.

NEW PUBLIC HEALTH AGENCIES

PRESIDENT Portes Gil has ordered the establishment of two new branches of the Mexican Department of Public Health: an office of sanitary exchange and a service of industrial hygiene and social prevision. The first of these departments will have charge of collecting foreign data on public health, publishing Mexican accomplishments in that field, insuring observance of obligations assumed by Mexico in international conventions concerning public health with reference to reports and notices, and keeping informed as to international congresses of health and hygiene while furnishing the necessary material and documents to Mexican delegates to such congresses. The second department has been created to watch over the sanitary conditions in places of work and the home conditions of the laborers.

PERSONALS

DR. WILLIAM H. WELCH, President of the Maryland State Board of Health, has resigned this position. He is the Director Emeritus of the Johns Hopkins School of Hygiene and Public Health, and the duties in connection with this position are enough to keep him occupied full time.

DR. THOMAS S. CULLEN, of Baltimore, was appointed by Governor Ritchie to succeed Dr. William H. Welch on the Maryland State Board of Health.

DR. W. W. FENTON has been appointed City Health Officer of San Bernardino, Calif., to succeed Dr. Ivan Lewis Finkelberg.

DR. ELMER H. BEST has been elected Health Commissioner of Freeport, Ill.

DR. GEORGE A. BARNETT has been appointed Health Officer of Riverside, Ill.

DR. JOSEPH G. BOSLEY has been reelected Health Officer of Madison County, Ky.

DR. HENRY ALBERT has been reappointed State Commissioner of Health of Iowa.

DR. THOMAS J. GLASSCOCK has been elected President of the North Dakota Health Officers Association.

DR. GEORGE D. HEATH, JR., has been appointed Health Commissioner of Florence, S. C., succeeding the late Dr. Percy H. Brigham.

DR. JAMES G. BLACK has been chosen Health Officer of Rutherford County, Tenn., succeeding Dr. Harry S. Mustard, resigned.

DR. W. F. WALKER, Field Director of the Committee on Administrative Practice, addressed the American Legion at Racine, Wis., June 6, on the Preschool Round-up. At the Annual Conference of Health Officers and Public Health Nurses at Saratoga Springs, N. Y., June 25–27, 1929, Dr. Walker gave an address on the Appraisal of Nursing Service.

CONFERENCES

July 8–12, American Medical Association, Portland, Ore.

July 9, American Heart Association, Portland, Ore.

Sept. 26–28, Association of Military Surgeons of the United States, Denver, Colo.

Sept. 30–Oct. 5, American Public Health Association, Minneapolis, Minn.

Sept. 30–Oct. 5, American Child Health Association, Minneapolis, Minn.

Sept. 30–Oct. 5, International Society of Medical Health Officers, Minneapolis, Minn.

Sept. 30–Oct. 5, American Association of School Physicians, Minneapolis, Minn.

Sept. 30–Oct. 5, Northwest Conference of Child Health and Parent Education, Minneapolis, Minn.

Sept. 30–Oct. 5, Minnesota State Sanitary Conference, Minneapolis, Minn.

Sept. 30–Oct. 5, Minnesota State Public Health Association, Minneapolis, Minn.

Sept. 30–Oct. 5, Minnesota State Organization for Public Health Nursing, Minneapolis, Minn.

Sept. 30–Oct. 5, American Social Hygiene Association, Minneapolis, Minn.

Sept. 30–Oct. 5, Conference of State Laboratory Directors, Minneapolis, Minn.

Sept. 30–week, National Safety Council, Chicago, Ill.

FOREIGN

July 25–Aug. 4, World Federation of Education Associations, Geneva, Switzerland

Aug. 8–21, World Conference on New Education, Elsinore, Denmark

Aug. 22–29, Adult Education Conference, Cambridge, England

Oct. 16, International Conference for the Revision of International Classification of Causes of Sickness and Death, Paris, France

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